# BASIC NURSING

# 2

# FUNDAMENTALS OF SUCCESSFUL LIVING FOR THE PRACTICAL NURSE

## *RULES OF BEHAVIOR*

We learn in childhood that we must behave in certain ways if we wish to live in harmony with other people. Rules of behavior are laid down for us by our parents and teachers, and as we grow older, we see for ourselves that those rules are necessary and right.

A practical nurse has to conform to rules which govern her relations with patients and their families, with doctors, and with other members of the nursing care and hospital team. With experience she sees that unless certain rules are observed, a group, however small, or an organization, however large, does not function smoothly Florence Nightingale, the founder of modern nursing, had the visior to see that caring for the sick requires not only kindness and devotion but thorough and special training, and that the instruction of nurses in ethical behavior is an important part of their training.

Ethics means right behavior. It is, according to the dictionary, "the science treating of human ideals by the highest standards of right and wrong." The practical nurse has such an intimate relationship with her patient that she should uphold the high standards and code set up for the professional nurse. The meanings of the words

*ethics* and *etiquette* are often confused. Etiquette is defined as "manners required on particular occasions." Rules of etiquette, then, concern manners, while the rules of ethics are founded on morals.

Basic in the behavior of the nurse is her religious self. Nursing has its roots in religion, and as a nurse prepares herself to minister to others, she needs the spiritual comfort and guidance of her own religious faith.

Nurses enter intimately into the lives of people. In a very short time they may become aware of certain facts not known even to other members of the family. It is obvious, then, that they must be persons who can be trusted not to discuss the affairs of their patients. Likewise, out of loyalty to her professional colleagues, the nurse will not speak unfavorably to a patient about his doctor or another nurse caring for the patient.

The nurse's behavior is, of course, the outward manifestation of the kind of person she is. The personality traits, characteristics. and habits she brings into nursing will shape her behavior. She will find, however, that if she is to succeed in nursing, she will have to put more emphasis on certain attributes than on others. Loyalty or faithfulness is one of these. She now belongs to a group of people devoting their lives and efforts to the care of the sick. If she does her part to conform and to become a loyal member of this group working toward a common goal which she shares, her reward will be a rich and happy life. If, on the other hand, she criticizes and in other ways defeats the efforts of this group, she will not find satisfaction in nursing.

Truthfulness is another essential in nursing. Truth means much more than not telling lies. In nursing, in particular, it means confessing a mistake. If the nurse fails to give a medication, she must report it at once. In this way, her error may be corrected and no harm may result to the patient. If she conceals her mistake, she not only jeopardizes the patient's welfare but she subjects herself to unnecessary worry. Most significant, however, is the fact that people will lose respect for her. If she is to be an effective member of the nursing care team, she must have the respect of her associates. Nevertheless, situations will arise when she will be asked a question which it is not within her province to answer. She is not under obligation to give a direct answer. She should refer the inquirer to the proper authority

*Attitude toward others.* Just as her behavior will reflect the kind of person she is, so her attitude will indicate the kind of nurse she is. If she is conscientious, interested in her patients, and considerate of others, she has an excellent foundation. No nurse, however skillful, can achieve success today unless she can get along well with her associates. A "good attitude" is nothing more than putting into action a desire to do right in dealing with other people.

In the past the tendency has been to formalize the behavior of the practical nurse by requiring her to show militaristic deference to her superiors. It is now felt that good manners and common courtesy should govern her relationship with others. She will naturally stand when being addressed directly and go forward to meet her professional colleagues or visitors entering the ward or a patient's home. Her whole manner should reflect a desire to cooperate with others and to carry out directions given to her.

Good professional taste requires that no part of the uniform be worn in public. If travel between one's home and place of employment in uniform is necessary, the uniform should be covered with a long coat, and the cap should be carried in a box or bag. A locker for clothes can usually be obtained at a hospital, and provision for changing into uniform at a private home can be arranged with the family.

*Smoking.* Whether or not to smoke in uniform is another question which the nurse will have to decide for herself. Smoking in uniform is permitted in some places, but the nurse who does not develop this habit is wise. The odor of tobacco, which settles in the hair and uniform, may be offensive to some patients.

*Consideration in use of supplies.* Many nurses who are thrifty in managing their own affairs fail to recognize the need to be economical of patients' household expenditures and of hospital supplies. Most of the voluntary hospitals today are operating under an overburdened budget. The interest from their invested funds is less than formerly, and the cost of running a hospital has risen fantastically in the last few years. Some of this increased operating cost is due to higher salaries being paid nurses, to shorter work weeks, better personnel policies, and expanded educational programs. These are all very important to nurses, and they, in turn, should show their loyalty to the hospital administrators by being economical in the use of supplies. Another commodity which is part of hospital assets is the

nurse's time. A nurse who is punctual, regular in attendance, and skillful in the management of her own time while on duty shows a kind of loyalty which is recognized and appreciated by hospital administrators.

## *PERSONALITY TRAITS*

The famous physician and philosopher, Sir William Osler, was once asked what special virtues, other than those of an ordinary woman, were needed in a nurse. He replied that no special virtues were needed but that circumstances demand the exercise of the ordinary virtues in a special way. He listed seven virtues: tact, tidiness, taciturnity, sympathy, gentleness, cheerfulness, and charity.

Tact means doing and saying the right thing at the right time and in the right way. Tact may be acquired by understanding and kindness. With tact many a delicate and difficult situation has been handled skillfully. The tactful nurse is courteous, for she knows that tact combined with courtesy results in harmonious human relationships.

Tidiness is used by Dr. Osler in a broader sense than that of personal neatness. A woman might be immaculate personally, yet would be considered untidy if her surroundings were unclean or her work were done in a slipshod manner.

Taciturnity is defined as not being inclined to conversation. It does not mean maintaining absolute silence. It does signify never repeating confidences given to the nurse by her patient and never telling anything she may learn about her patient's family or friends. Curious people may question her, but they will respect her more if they are unable to break down her honorable reserve. It is better to be silent than talkative, as conversation is tiring to patients and often makes their condition worse.

Sympathy implies that the nurse has the ability to enter into the feelings of her patient. She is deeply, but perhaps silently, in accord with his desire to improve in health and well-being.

Gentleness is kindness or amiability. Although, in general, gentleness implies being soothing and tender, in nursing, gentleness can best be shown by deftness or skill in performing nursing procedures. This is more advisable than showing so much tenderness that the

patient feels he is being treated as if he had no strength to sustain his discomfort

Cheerfulness is often an important factor in helping a sick or depressed patient to recover A cheerful nurse is one who builds up courage, brings comfort, and restores hope to her patient by being pleasant, bright, and eager to serve rather than by laughing or joking in thoughtless gaiety

Charity is a benevolent feeling toward those in need It is shown in nursing by making allowances for the patient's point of view and by not judging his reactions or opinions harshly even though one may not approve of them

All these and other virtues should be linked together by the best of all counsel, the Golden Rule "And as ye would that men should do to you, do ye also to them likewise" A nurse should try to put herself in the patient's place and consider how she would like to be treated if the situations were reversed To do this she must have imagination and also the ability to think straight—to determine what is actually true and not to be blinded by wishful thinking

## *SUMMARY*

In a hospital, where many persons cooperate to restore the sick to health, rules and regulations must be formulated, understood, and followed exactly to achieve the greatest efficiency

The successful nurse owes it to those with whom she may be allied in the hospital or in the home to be ethical, courteous, loyal, truthful, conscientious, and cooperative

Although her attitude toward her superiors is not today based on militaristic deference, she will show respect and courtesy toward them She will wear her uniform correctly and proudly She will be economical in the use of supplies as her contribution toward the aim of keeping expenses down

She will succeed most easily in her relations to others if she is tactful, tidy, discreet in her conversation, sympathetic, gentle, cheerful, and charitable

Although all of us need these same qualities, the nurse, especially, should live according to the Golden Rule She will find strength and courage in following the tenets of her religious faith

## Questions

1. Why should a nurse be willing to conform to hospital rules?
2. What is the distinction between ethics and etiquette?
3. What benefits are to be derived by the nurse in being loyal?
4. What is meant by the nurse having a good attitude toward other hospital personnel?
5. What general rules govern the wearing of your uniform?
6. If another young woman asked you what qualities a nurse should have, what traits would you list?

# 3

# THE PRACTICAL NURSE: HER DUTIES TO HERSELF

## *SAFEGUARDING OUR MENTAL HEALTH*

A fundamental requirement in nursing is to be physically and mentally healthy Fortunate is the nurse who has both physical and mental health, but often both can be acquired

The weak person falls back on such excuses as "I can't help it," "My father was [this or that]," "It runs in my family," or "I am more sensitive, other people don't mind things as I do" To be perfectly honest about our own shortcomings is difficult, but to have good mental health we should be willing to look at ourselves as we would at another person

It helps to ask ourselves such questions as "Do I bear a grudge against anyone?" "Am I thinking of myself first or of my friend or patient?" "Do I excuse myself when something goes wrong, or do I admit my mistake and build on it?" "Do I waste time worrying over things which may never happen, or when they do occur, do I meet each situation to the best of my ability?" "Do I indulge in self-pity, or do I forget my own troubles in helping someone else?" "If anyone speaks to me rudely, do I give an equally rude answer, or do I control my natural feelings of annoyance and respond to

rudeness with courtesy?" "Do I make excuses for myself and blame others for my mistakes or failures, or do I reason with myself and face the facts with honesty?"

Avocations. The person who is mentally healthy is a happy person who finds pleasure in little things and has interests outside her job. She gets along well with people because she sees something to like in everyone. She makes herself happy in uncongenial surroundings and, instead of grumbling if things do not go well, does what she can to improve the situation. She is secure in herself and does not ask for undue attention, sympathy, or service from others. The mentally healthy person will accept criticism for self-improvement because she sincerely desires to improve and she realizes that to be self-satisfied is not constructive.

Much unhappiness in life is caused by not making plans for the future. Many persons over sixty-five live empty lives because they have not considered what they will do to fill their later years. People who have limited themselves to one kind of occupation throughout their working years and have not cultivated other skills or hobbies are often at a loss to know how to use their leisure hours.

The practical nurse may already have at least a potential or slight interest in various diversions without having done much with any one of them. She might well take them up, one after the other. Later on, when she has retired from active duty, her favorite hobby may become a pleasant and perhaps profitable avocation.

She will find many suggestions as to what her choice might be if she will browse through the shops displaying handwork, become familiar with stores selling supplies for hobbies, and look into the various periodicals devoted to the creative arts and crafts.

She can also use her hobby interests in her nursing work. To tell her patient about her explorations may give him a fresh or renewed interest in a particular constructive diversion. In general, it will satisfy his longing for something new to think about.

Financial security. However, plans for leisure occupations are not the only ones she will want and need to make. Everyone should manage her finances so that she may not only take care of her current needs but also make provision for future years. The practical nurse should establish the habit of regular savings, however small. She should carry health and hospital insurance as a protection in

the event of accident or illness, and she should investigate insurance plans in order to select a suitable type of life insurance, annuity plan, or endowment which would cover her estimated future needs and also be within her present ability to finance

## *MAINTAINING GOOD PHYSICAL HEALTH*

In former days the physician's work was primarily to cure the sick, while now his efforts and those of the community are directed increasingly toward keeping people well The nurse's efforts toward keeping well should begin with keeping clean Cleanliness, which means clean surroundings, clean food, and clean clothing, as well as clean bodies, is the best protection against disease

### BATHING

The daily bath is a necessity because it removes the wastes thrown off by the oil and sweat glands and aids the general health by its effect on the circulation

Soap is necessary to remove dirt, as water alone does not do this Soap is a combination of a fat and an alkali which emulsifies the excess oil on the skin and thus removes both oil and dirt Highly colored, strongly scented soap frequently contains rancid fat disguised by perfume

Cold bath. The temperature of a cold bath is below 65°F (18 3°C ) The effect of a cold bath is to contract the small blood vessels near the surface of the skin, thus driving the blood to the internal organs and increasing their activity Normally the cold bath, followed by friction with a rough towel, stimulates the nervous and circulatory systems and improves the tone of the muscles Anyone whose circulation is good can take a cold sponge or tub bath if she trains herself by gradually lowering the temperature of the water until the body becomes accustomed to cold and reacts properly When the circulation is poor, a cold tub is inadvisable The best time to take a cold bath is in the morning before breakfast

Tepid bath The temperature of a tepid bath is 70° to 90°F (21 1° to 32 2°C ) A tepid bath is mainly for cleansing purposes

and may be taken at any time during the day. However, one should not take a bath within an hour after a meal, since during that period the digestive system needs its full quota of the blood supply.

Warm bath. The temperature of a warm bath is 90° to 100°F. (32.2° to 37.7°C.). Waste materials accumulate in tired muscles and on the surface areas of the skin. A warm bath brings more blood from the internal organs to the muscles and the skin. The increased activity of the blood in these areas helps to carry away the waste products. This produces a soothing effect upon the nervous system and tends to induce sleep. For this reason, the best time to take a warm bath is just before going to bed.

Hot bath. The temperature of a hot bath is above 100°F. (37.7°C.). Since a hot bath is very relaxing, it should not be indulged in without the advice of a physician.

Bathing at the menstrual period. There is an old superstition that bathing at the menstrual period is harmful. On the contrary, a warm or tepid bath is beneficial, and frequent local baths are necessary to avoid any unpleasant odor. Fresh pads should be applied every four hours, and some deodorizing powder on the pad is advisable. A normal woman may go about as usual during the menstrual period but should refrain from violent exercise, such as swimming, rowing, horseback riding, and skating, or anything which may check or increase the flow.

## OTHER FACTORS OF PERSONAL HYGIENE

Care of the hands. Scrupulous care of the hands is necessary for a nurse. She will naturally wash her hands before eating or preparing food, and after going to the toilet; but the hands should always be washed before and after doing anything for the patient. The nurse will let the patient see that she is just as careful not to bring dirt or germs to him as she is to protect herself from possible infection.

Washing one's hands does not mean holding them hastily under the faucets; it means using plenty of soap and water and her own nailbrush, rinsing the hands in cold water, then wiping them dry.

Since frequent washing makes the skin dry and chapped, hand lotion should be used during the day, and cold cream rubbed in at night. This treatment also prevents the formation of hangnails, which make little openings where infection may enter. The cuticle

should be gently pushed back at least twice a week, and petroleum jelly or cuticle oil should be applied to the base of the nails and under the nails every night The fingernails should be kept short It is well to use orangewood sticks for cleaning the nails, as steel nail files scratch the undersurface of the nails and make places where dirt and germs may lodge A stiff nailbrush used vigorously will take care of the dead skin

Special attention should be given to any break in the skin, however small, as the tiniest scratch or pinprick makes a place where germs may enter An antiseptic should be applied, and the place covered

**Care of the hair.** The hair should be brushed for several minutes night and morning This care improves the natural or permanent wave if the brush is used properly Brushing removes dust from the hair and stimulates the circulation of the scalp The principal causes of falling hair are dandruff and lack of circulation Dandruff is an accumulation of dead skin mixed with oil from the sebaceous glands, a mixture which dries and forms a crust interfering with the action of the oil and sweat glands For excessive dandruff, one should consult a skin specialist The circulation can be improved by massaging the scalp

The hairbrush should have stiff bristles but not stiff enough to give a feeling of soreness in the scalp The comb should have blunt teeth well separated to avoid scratching the scalp and tearing the hair Both brush and comb should be washed every few days in order to avoid returning to the scalp the dirt which has been removed

To keep the hair clean, it should be shampooed often However, the frequency depends upon the person's occupation and living conditions In the city where soot and dirt are always present, the hair needs shampooing more frequently than in the country

**Care of the teeth** We know that the tooth structure is built in childhood, therefore, the proper diet is of the greatest importance But the lack of proper diet in adult life is believed to influence tooth decay Chewing a certain amount of hard, coarse food will help to prevent early decay of the teeth and keep the gums in good condition Those who eat only soft, sweet food find that their teeth decay early in life Removing food particles from between the teeth with dental floss and keeping them clean ward off decay

*Points to remember in care of the teeth*

1. Brush the teeth night and morning and after every meal if possible
2. Brush with rotary motion, reaching all surfaces.
3. Keep two toothbrushes in use in order to have one dry for morning and night.
4. Unless you use a toothbrush whose bristles remain firm indefinitely, discard your brush before it becomes soft from use.
5. Use toothpowder or paste at least once a day. A good dental powder may be made at home with one part of salt to three parts of baking soda. Using this powder and massaging the gums are helpful measures in maintaining your teeth in good condition.
6. Visit your dentist every six months so that he may not only fill large cavities about which you may be aware but also may discover small cavities and fill them before they become large and more expensive to take care of.

Care of the nose. Breathing through the nose helps to prevent disease. The nose acts as a filter to catch dirt and germs, and the air breathed in is warmed and moistened as it passes through all the tiny passages on the way to the lungs. When caring for the sick, the nurse should always use tissues which can be destroyed after use.

Care of the eyes. To avoid straining the eyes, the nurse will need a good light for reading or sewing. The light should come over one shoulder, on a level with the head. After continued close work, it rests the eyes to close them for a few moments. Then, if possible, one should look off into the distance. Sometimes indigestion, sleeplessness, headache, and dizziness are caused by eyestrain. An eye specialist should be consulted if these conditions persist.

Care of the feet. Since one has to stand or walk for so many hours a day, care of the feet is important in nursing. When the feet are tired and aching, it is refreshing to bathe and powder them and to change both the stockings and shoes.

*If the feet perspire excessively*, measures must be taken to prevent an unpleasant odor. The feet should be washed twice a day, dried without friction to avoid stimulating the sweat glands, and dusted with a drying powder. A good foot powder can be prepared at home by putting one part of powdered salicylic acid to four parts of fine-powdered starch.

*The toenails* should be cut straight across to avoid ingrown nails

A *corn* is a local excrescence (abnormal outgrowth) caused by ill-fitting shoes Corns should have the attention of a skillful chiropodist, and the cause should be removed

*Stockings* should never be put on a second time without washing The stockings may not appear to be soiled, but they have absorbed wastes thrown off by the skin They will last longer if they are rinsed out as soon as they are removed, as perspiration rots them Stockings should be long enough in the feet to allow motion of the toes

*Shoes* Comfortable, well fitted shoes are essential The Oxford is the best type of shoe to wear as it gives proper support The shoes should be long enough and wide enough to allow the toes to straighten out and must be tied firmly on the instep to keep the heel in its proper position in the counter of the shoe In correct posture, the weight is divided equally between the ball and the heel of the foot If the toes are cramped and folded over each other, this posture cannot be held, and the nurse will tire more easily The heels should be broad and low One cannot walk any distance or stand a long time without fatigue in high-heeled shoes, because energy is wasted in holding the body in a wrong position Even though well made shoes are expensive, they are worth buying and can be made to last a long time if they are kept clean and in good repair The heels of the shoes should be kept built up A run-down heel has a slovenly appearance and throws the foot out of position

Her feet will be less tired if the nurse keeps two pairs of shoes in use and wears them on alternate days When taking off her shoes at night, she should clean them and insert shoe trees to make the shoes last longer, to smooth out any wrinkles, and to preserve the shape of the shoes Next morning she will put on the second pair of shoes Shoes should be aired frequently since the lining absorbs perspiration

Clothing should not constrict the body but should be loose enough to allow the circulation of air Common sense should be used in choosing clothes adapted to the nurse's occupation and the weather If she must be out in all kinds of weather she should provide herself with a long rainproof coat with a hood Many colds can be prevented by keeping the feet dry and warm Rubbers and overshoes are good investments

repeated ten times, every day, or twice a day, during the week before the period:

1. Lie on your back with the knees bent and the feet resting on the bed.
2. Draw the abdomen in as far as possible.
3. Relax.
4. Lift the abdomen slightly.
5. Relax.

**Exercise, recreation, and rest.** A person cannot be well balanced either mentally or physically without the proper amount of exercise, recreation, and rest. The amount of exercise depends upon the occupation. Anyone who sits all day needs more exercise than one who is constantly on her feet. But even a person moving about in the house throughout the day needs some exercise in the open air. Walking is one of the best forms of exercise when it is done briskly and is enjoyed. Swimming, dancing, handball, bowling, and so on, bring other muscles into play.

Recreation is any pastime which affords refreshment, a new point of view, or an agreeable diversion. Recreational activities are both pleasant and relaxing. Some people enjoy playing games, while others prefer listening to music or using their hands in sewing, drawing, modeling, gardening, or other kinds of creative activity.

Recreation and rest may be the same thing. Although rest is not necessarily lying flat on one's back, a person who can lie down and relax, even for a few minutes, gets up feeling refreshed. It is also restful to change one's occupation, go to the theater, drive, read an entertaining book, or find something else to think about.

In the recreation or resting time, the nurse should not talk about patients, nursing, or hospitals. She will then return to the sickroom refreshed and ready to work. It will help her patient if she has something new to tell him, something which will take his mind off himself and prevent him from dwelling on his own discomfort.

After the age of twenty-five, a thorough health examination once a year is a good investment. Some weakness or irregularity of function may be discovered, and any bad habits corrected, in time to prevent serious trouble later. Health clinics where these examinations are made at a small charge are established in the hospitals of most cities.

Common colds. More time is lost in a year by colds than by all the industrial strikes in the whole country Below are seven good precautions against catching cold

1 Drink eight glasses of water every day
2 Sleep eight hours a night
3 Eat three properly balanced meals a day
4 Avoid chills and wet feet
5 Avoid overheated rooms
6 Be sure of proper daily elimination
7 Stay away from persons who have colds

These are all good health habits and should be consistently maintained If you keep in good condition, you are less likely to catch colds even if exposed to them

## *FORMING GOOD STUDY HABITS*

Many persons go through life without discovering the great difference between reading and studying We may read for various reasons for pleasure, for entertainment, to while away the time, to find out what other people are reading, or merely to keep up with current events or the latest books However, as a student, you must not only store in your mind the essentials of what you read but must also begin to think for yourself You read, therefore, to locate the principal points to be learned and to acquire a background of supporting materials which will broaden your knowledge and make it sound How you react to what you read is important The first indication that you are learning to study will be the moment when you begin to talk to the author silently about what he is saying Your serious reading and study will largely determine the degree of your success You may feel that you have no time for reading or that you will find more time to read when you are older, but experience shows that in youth we have more time to read than we ever have later in life Much can be gained by learning how to budget your time Effective study will give you more time to devote to recreation and to self improvement in areas outside your nursing course In your preparation for practical nursing, studying intensely for one hour will be better than reading for several hours without thoughtful concentration Good study habits are not only immediately reward

Nothing is so disagreeable to a patient as the odor of perspiration. Every care must be taken to be clean. The daily bath is not sufficient when a person perspires freely. Frequent local bathing is also necessary. One should choose a pure, lightly scented soap which agrees with one's skin. To be avoided are perfume, powders, and highly scented soap when caring for the sick, as a perfume which is agreeable to the nurse may be very disagreeable to her patient. A uniform or dress which is stained or wet under the arms is inexcusable; those who perspire freely should always use dress shields and be careful about washing them frequently.

We know that perspiration contains waste. Therefore, underwear worn next to the skin absorbs these wastes and should be changed daily. A few pieces of underwear may be washed easily at one time. Two girdles would facilitate frequent laundering.

Food. The proper food for the normal person and the reasons why certain foods should be eaten are both discussed in Chapter 17, "Food: The Foundation of Good Health."

Even though the effect of the mind on the digestion of food is not mentioned in these chapters, it should be considered, as the mind has a very important effect on digestion. At meals we should try to put away all worries and disagreeable thoughts and talk about something pleasant. If the nurse does not feel able to make the effort required to clear her mind of negative thoughts, she should not eat heartily as the food will not be properly digested if she is troubled or angry.

If a little child is forced to eat when he is angry or upset, he often vomits the food, thus involuntarily relieving his stomach of food which it cannot digest. Older persons do not give themselves this relief but force the stomach to do its work improperly. Since a tired stomach also finds it difficult to perform the work of digestion, one should drink a glass of milk slowly when fatigued and wait until rested to eat more heartily. Food should always be eaten slowly and should be well masticated, not washed down with liquid. In order to give the digestive system a rest, one should not nibble at food or candy between meals.

Care of the bowels. The bowels should move well at least once daily and at a regular time, preferably just before, or just after, breakfast. This operation must not be postponed because it is incon-

venient, as neglect of proper habits leads to constipation and other disorders Proper elimination depends upon regularity, the right food, plenty of water, and regular exercise

Sleep. An adult needs eight hours of sleep every night Unbroken sleep cannot be expected in nursing, as the patient is likely to require some attention at night A good rule for the nurse on private duty in the home is to go to bed early several nights a week when possible, to make up for sleep which may be lost on other nights

Posture. Proper posture is more important than most persons realize It has an influence on the health, because if one stands badly, the organs are thrown out of place and do not function as they should When one is standing in the proper position, the head should be erect, the chin in, the chest up and forward, the abdomen flat, the back almost flat, and the feet parallel, with the weight evenly balanced

A person can find out if her posture is correct by standing against a wall with her heels five inches from the wall to give her room for the buttocks In this position, her head, shoulders, and back should touch the wall If she finds it impossible to hold her back against the wall, she is not using her abdominal muscles correctly Her instructor will be glad to help her correct faulty posture, but it may be necessary to go to a posture clinic

A good way to maintain posture and at the same time to obtain a certain amount of rest is to lie on the floor on a blanket, or on a flat mattress, with a pillow under the shoulder blades but not under the flat of the back A pillow may also be placed under both knees This arrangement induces deep breathing and a drawing in of the abdominal muscles, both of which are necessary for good posture

*Posture in the sitting position* While seated, the body is in good posture if the head and trunk are in the same position as when standing The hips are flexed at right angles to the trunk, and the knees are flexed at an angle determined by the position of the feet The feet rest flat on the floor, at right angles to the lower part of the legs, either parallel to each other or one placed slightly in advance of the other.

Exercise to relieve dysmenorrhea Pain or difficulty at the menstrual period may be relieved by special exercises The following exercise should be done as you count up to four, and it should be

outside her tour of duty and her vocation. She will look around to find a hobby which grips her imagination, and in the spirit of friendliness she will bring back to her patient suggestions for diversions which will help him take a renewed interest in living.

The farseeing nurse will make some plans for her financial future and will establish regular savings habits.

Good physical health is essential to the nurse, for her ability to continue in her work is dependent on it. The more she understands the importance of daily care, bathing, exercise, and proper diet, the more she will see the value of being instructed in the most approved methods.

The studies she must undertake to prepare herself for the responsible nursing care of her patients are not and cannot be made simple. Good study habits are, to a large extent, the key to her scholastic success. Since there will be little time for review, it is a good idea to master each day's assignments as one goes along.

Since the nurse is responsible for her actions, she owes it to herself to become informed as to her legal as well as her moral responsibilities.

## Questions

1. Why does a healthy person generally get along well with others?
2. How would you suggest that anyone could test her own attitude to see if it is constructive?
3. Why is it well to cultivate a hobby or other outside interests?
4. Where and how can a nurse enlarge her knowledge of interesting diversional occupations?
5. What plans can be made to provide financially for future years?
6. What are good effects of a daily bath?
7. Discuss the different effects of baths taken at different temperatures.
8. Discuss in detail handwashing, care of the nails, hair, teeth, nose, eyes, and feet.
9. On what does good elimination depend?
10. How many hours of sleep does an adult require?
11. Name seven ways in which to establish good study habits.

# 4

# THE PRACTICAL NURSE: HER DUTIES TO THE COMMUNITY

## *FUNCTIONS OF THE COMMUNITY*

The community provides many services for the welfare of all the citizens who comprise it Neither individual persons nor their families today can supply for themselves all of the services which they need Thus the community makes provision for the adequate protection of the lives and welfare of its people, in other words, it assures their right to life, liberty, and the pursuit of happiness But for every right which the individual citizen enjoys, he owes a corresponding duty All citizens can enjoy their rights only when each citizen obeys the laws and regulations which protect the entire community and when each contributes to the common welfare of the community

Life today is far more complex than when our forefathers settled this country If we stop to consider the number of people who have had some part in the growing, distribution, and preparation of the food we eat in one day, or of the clothing we wear, it will help us to realize the extent to which each of us is dependent upon others all over the world The knowledge of our dependence upon others and of the dependence of others upon us makes us better understand our mutual rights and obligations

ing but may lead you to one of the most worth-while and least expensive of hobbies, the companionship of good books.*

*Seven ways to establish good study habits*

1. Do your studying where you are not likely to be disturbed.

2. Try to study at a fixed time every day and limit your study to one hour at a sitting, at first. If you need to study more than one hour, take a ten-minute recess, during which you should move about and rest your eyes.

3. Sit comfortably but squarely at a desk or table. Do not slouch down in an easy chair. Have a good light properly placed. Rest your book on another book or on some other solid object at a 15° angle rather than lay it flat or hold it in your hand. You will find that this arrangement will make it easier for you to take notes as you read.

4. Read through your assignment rapidly to become familiar with its content and terminology rather than to retain the important points at first. Careful rereading is now necessary to note the important points and to make sure that you understand the author's meaning. You should underline the main ideas and summarize the material in your own words. A final reading is generally helpful, for it enables you to see the assignment as a whole.

5. Consider your class hour as your most intensive study period. Concentrate on what the instructor is saying and make an effort to contribute to the class discussion.

6. Learn to make good notes. There is a distinction between taking notes and making them. Taking notes can be simply transferring to your notebook what the instructor is saying, without any mental reaction on your part. When you make notes, however, you are thinking about the subject as your instructor presents it Outlining the material is a popular method of making notes. If it seems impossible to outline effectively, divide your paper into two columns, using the left hand column for the notes you make in class and the right hand column for your revision of these notes to be made during your next study period. You will find a large loose-leaf notebook very useful.

7. With your revised notes beside you, return to the assignment and read it carefully, one section at a time. Try to fix in your mind the chief facts. Compare your notes with the textbook. If you discover differences, plan to ask your instructor about them, for your question may help to clarify some points for your classmates and possibly will assist your instructor to present the material more clearly at another time.

* The student will find helpful suggestions in *Learning More by Effective Study*, by Charles and Dorothy M. Bird. Appleton-Century-Crofts, Inc., New York, 1945.

## ORIENTATION TO THE COURSE

The study of the human body centers around different aims and points of view depending on exactly what the student—physician, surgeon, histologist, technician, nurse—is chiefly interested in.

Anatomy is the study of the structure of the body: the size, shape, and location of every part and its relation to the structure of other parts. The surgeon is primarily interested in anatomy, for by his knowledge of the structure of the human body he is able to correct some defects by surgical operations.

Physiology is the science which deals with the functions or purposes and the relations between the different parts of the body. The physician is chiefly interested in physiology, for by finding out what aids the body or what tends to injure it he can evaluate correct habits, treatments, and hygienic care.

The function and role of the practical nurse is the main theme of our volume. In general, she assists the physician and the surgeon in carrying out their basic aims of restoring their patients to health and well-being. Obviously, she will be able to carry out doctors' orders faithfully and conscientiously when she knows enough to carry them out intelligently. To be of maximum service, she, as well as any other member of the medical arts group, needs a knowledge of the structure and functions of the human body. On her rests the responsibility for giving comfort and relief to the patient, as a person, through total nursing care.

## SUMMARY

The practical nurse owes two duties to herself: to remain well balanced mentally and to keep physically fit. The old ideal of a sane mind in a sound body holds as good today as ever. To get along in society one must face problems squarely, without remorse for what cannot be remedied, but with determination to do better in the future. We cannot work successfully with others unless we shoulder our responsibilities.

Since all work eventually becomes monotonous if tension and tedium are not relieved, the nurse will do well to cultivate interests

## COMMUNITY HEALTH SERVICES

Of vital concern are the health services which the community renders to its citizens. These are called public health services because they serve the community as a whole. Two types of organizations supply health services:

1. Official or governmental agencies financed by the tax dollars of the individual citizens
2. Voluntary or nonofficial agencies supported by voluntary contributions of private citizens

For example, the dollar you contribute to the Community Chest Drive in your town or city helps to support the voluntary health and social agencies operating there. Both types of organizations are extremely valuable. The voluntary agency has led the way in proving the need for special health projects, while the governmental agencies carry on those activities which have been proved to be both useful and necessary and for which the people are willing to pay through taxes.

The World Health Organization of the United Nations considers the health of the people on an international basis and deals with such problems as the control of narcotic drugs, the prevention of the spread of disease, and quarantine.

Governmental health services are supplied on the federal, state, and local levels. According to Harry Mustard, M.D., the federal government is concerned with:

1. The prevention of the importation of disease from abroad
2. The prevention of interstate spread of disease
3. The maintenance of the health of the nation, as a whole, in general, but not in detail. A state has as its duty the prevention of diseases only within its borders and the maintenance of the health of its citizens.*

The majority of the health activities of the federal government are administered by the Department of Health, Education, and Welfare. Among these are the Social Security Administration, which

* Mustard, Harry: *Introduction to Public Health*, 3rd ed. The Macmillan Company, New York, 1953, p. 45.

supervises Old-Age and Survivors Insurance, the Public Health Service, the Bureau of Public Assistance, and the Children's Bureau *

The Children's Bureau is mainly concerned with maternal and child health, services to crippled children, and child welfare The federal government also gives grants-in-aid to individual states for these services within their borders

The United States Public Health Service was originally founded to give medical aid to American merchant seamen It still retains this function but has added many other activities, such as those pertaining to mental hygiene, control of venereal diseases, and research and study at the National Institutes of Health at Bethesda, Maryland

The Veterans Administration, an independent establishment, is concerned with medical service and hospitalization for men who have been in the armed forces

On the state and local levels, public health services include

1 Measures for the control of communicable diseases
2 Infant, child health, and school health programs
3 Community sanitation as related to water purification, protection of milk supplies, and disposal of sewage and garbage
4 Recording of births, causes of sickness, and deaths
5 Laboratory services for blood tests and throat cultures
6 Education of the public in matters pertaining to health †

Voluntary health agencies have generally been effective in preventing specific diseases or causes of death through education of the public and experiments in the prevention or cure of these conditions It would require considerable space to list and explain the work of these agencies, but many of them are so well known that their names are sufficient to reacquaint us with their programs

The National Tuberculosis Association
The National Foundation for Infantile Paralysis
The American Heart Association
The National Society for the Prevention of Blindness
The visiting nurse associations

* *United States Government Organization Manual 1953–54* Federal Register Division National Archives and Records Service Washington 25 D C

† Smiley, Dean Franklin, and Gould, Adrian Gordon *Your Health* The Macmillan Company, New York, 1951, P 411

Many municipalities operate free clinics, provide hospital services, and carry on diagnostic services for those who are unable to pay for medical care.

Professional associations, such as the American Medical Association and the American Nurses' Association, are concerned with the public health and with improving health services rendered to the people.

It is unlikely that one person could memorize all of the various official and voluntary health agencies that exist. However, the practical nurse should either know the health services available in the town or city where she lives, or know where she may secure information about them.

In many cities certain organizations, such as women's clubs and district nurses' associations, have built up loan closets from which some hospital equipment and appliances may be borrowed. Before the family of the patient purchases any expensive equipment the nurse should investigate the possibility of borrowing it.

The public library or chamber of commerce usually furnishes lists or directories of the local health and social agencies. To understand the special services of an agency, the nurse would do well to visit its headquarters in order to interview various department heads and to observe the center in action.

Since epidemics may spread from one community to another, close control is exercised by the state over the chief carriers of disease-producing bacteria, three of which are water, milk, and food supplies.

## WATER SUPPLY

The purity of the local water supply is of interest to everyone in the community. It is usually the direct responsibility of the state health department. Its sanitary engineers are in charge of the actual work involved in purifying the water supply.

The practical nurse can find out about the safety of any water supply, whether it is publicly or privately owned, by inquiring of the local health authorities.

Water is easily polluted, even if at its source it is relatively pure. The nurse should be especially suspicious of a well or spring on a

private estate, particularly if surface water can drain into it, or if it is adjacent to privies or stables from which bacteria laden water may seep

Although sewage may be, and generally is, rendered harmless before it is drained into rivers and streams, and although most bacteria borne by water are harmless, those disease-producing bacteria escaping destruction and finding their way into the water supply present a formidable menace

## MILK SUPPLY

Milk demands particular attention from public health authorities because it is a favorable medium for the multiplication of bacteria and because it is often consumed unpasteurized Contaminated milk can cause such diseases as typhoid, scarlet, and undulant fevers, and diphtheria

In addition to cleanliness in handling milk, pasteurization as performed by the milk distributors, under municipal regulation and inspection, will probably be always necessary It consists essentially in subjecting raw milk to a temperature of 145°F (62 7°C ) for thirty minutes before running it through pipes to cool it for bottling (See Chap 20, "Food Lessons")

The United States Department of Agriculture has tackled the problem of ensuring a safe milk supply at its source by inspecting dairy farms The federal government has also set standards for grading milk and has framed the United States Milk Ordinance All of these and other similar measures have been generally effective in emphasizing the importance of sanitation as a means of lowering the bacterial count in milk

## FOOD SUPPLY

The practical nurse can do much to see that food in her patient's home is not contaminated (1) by stressing that it be stored properly and prepared under sanitary conditions and (2) by seeing that it is cooked long enough to destroy harmful bacteria

The need for such protective measures is great, for food may be contaminated at any stage of production Oysters may grow in polluted beds, meat-producing animals may be infected, food handlers

may transmit disease by coughing or by dirty hands; surfaces on which food is laid out may not be clean.

Some remedial measures are in operation. Under the Federal Food, Drug, and Cosmetic Act, the ingredients are listed on the labels of packaged foods. State and local legislation and inspection have improved conditions a great deal; unfortunately, the evasion of health ordinances and codes by ignorant and indifferent food handlers is comparatively easy, especially in small scattered establishments.

One less tangible but far-reaching weapon with which to fight the spread of communicable disease remains. Citizens may be organized into groups which are both enlightened and realistic enough to see that public health education at all levels is a powerful way to enlist self-interest in ensuring pure water, milk, and food supplies in their own communities.

Patients or their families are often in need of the assistance community agencies can give. These may include such aids as placing a child in a day nursery, vocational counseling for a woman who has lost her husband, or securing the services of one of the special consultants of the visiting nurse association.

Certain people in a community are always ready to help with family difficulties. The nurse could suggest a visit to the minister or parish priest, or to the president of a men's or women's club. Often the family physician can give the needed counsel.

The practical nurse, while carrying on her duty to the sick, should also safeguard her own health and be ready to contribute her share to the health activities of the community.

## *SUMMARY*

Since life is becoming more complex, the individual has to depend increasingly on others, especially on organizations. Various agencies for adequate protection of health in the community are operated on both federal and local levels, some under governmental administration, and others supported on a voluntary basis. Each has a specific purpose, but, taken together, they cover our general health interests and problems.

The nurse should know what agencies are active in her community and should be informed as to the purity of the water, milk,

and food supplies on which her patient and his family must depend Moreover, she must know what measures can be taken in the home to prevent food contamination

When her patient needs assistance from community health services, she will then be able to put him in touch with the proper agency She should also contribute her share to community health projects

## Questions

1 Under what conditions are all citizens able to enjoy their rights in a community?
2 What is another name for the health services provided by various organizations for the community?
3 Into what two large groups are health agencies divided?
4 With what three public health conditions is the federal government concerned?
5 Under what two agencies are the majority of federal health agencies administered?
6 Name several services included in public health services at local levels
7 Name several voluntary health agencies devoted to the prevention and cure of specific diseases
8 Where might you locate a directory of local health and social agencies?
9 Name the three chief carriers of disease producing bacteria which, if uncontrolled, could cause epidemics
10 Of what water supplies should the nurse be especially suspicious?
11 When is milk likely to be a favorable medium for the multiplication of bacteria?
12 Name four diseases carried by contaminated milk
13 Discuss how the United States Department of Agriculture is trying to ensure a safe milk supply for the country
14 What protective measures can the nurse be sure are carried out in the home to prevent food contamination?
15 How do shellfish sometimes become polluted?
16 Consult the Glossary for the meaning of the following carrier, contagion, febrile, fumigation, micro , pollution, stagnation

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# PART II

## *The Normal Body: Its Structure and Functions*

# 5

# BODY STRUCTURE

The structure of the human body may be compared with a well-organized community. The thousands of small cells, grouped into tissue, may be compared to the individuals living together as one family. Tissues are joined to form organs, as families unite in churches. The organs work together to form systems, as schools are combined to form educational systems. Each of the body units—cells, tissues, organs, and systems—deserves further study.

## CELLS

A cell is so small that it can be seen only through a microscope. Its structure resembles that of an orange. It has an outer *wall*, a thin membrane, which protects the cell. Within the wall is a cell substance called *protoplasm*, which is similar to the edible part of an orange. Contained in the center of the protoplasm is the seed, or *nucleus*. Human life begins with the union of two single cells, the male spermatozoon and the female ovum. These cells grow by dividing into two, and the process goes on until millions of cells have been produced and the living body is formed. Cells differ in size, shape, and function, but basically all cells have three parts: (1) a cell wall, (2) protoplasm, and (3) a nucleus. Cells are constantly dying and are constantly being replaced.

## TISSUE

Different types of cells are present very early in the development in the uterus. When cells of the same kind group themselves together to perform a particular function, they are called tissue. There are five kinds of tissue in the body:

1. Epithelial tissue—skin, hair, nails, mucous membrane, and glands
2. Connective tissue—ligaments, tendons, cartilage, bone
3. Muscular tissue—muscles of the various parts of the body
4. Vascular or liquid tissue—blood and lymph
5. Nerve tissue—brain, spinal cord, and nerves

## LYMPH

The cells are arranged in layers with spaces of varying size between them. In these spaces between the cells is the tissue fluid, or lymph, which filters from the blood stream to bathe and feed the cells.

## ORGANS

Several different types of tissue, each performing a special task, are found in nearly every organ, all helping it to do its work. For example, the heart is composed of (1) muscle tissue, which squeezes (2) the blood (vascular tissue) out into the blood vessels; (3) mucous membrane (endothelium), which lines the inner surface of the heart to allow the blood to flow smoothly; (4) nerve tissue, which makes the heart function in rhythm or, as we say, coordinates its muscular action.

## CAVITIES

The cavities of the body are the dorsal cavity (cranial enlargement), which contains the brain, pituitary gland, and associated parts; the nasal cavity, which contains the internal parts of the nose; the buccal cavity, which contains the tongue, teeth, and associated parts; the thoracic cavity, which contains the heart, lungs, and large arteries and veins going to the heart and away from it; the abdominal cavity, which contains the liver, stomach, intestines (alimentary

canal), kidneys, and associated parts; the dorsal cavity (spinal portion), which contains the spinal cord and fluid; and the pelvic cavity, which contains the internal reproductive organs, urinary bladder, and associated parts

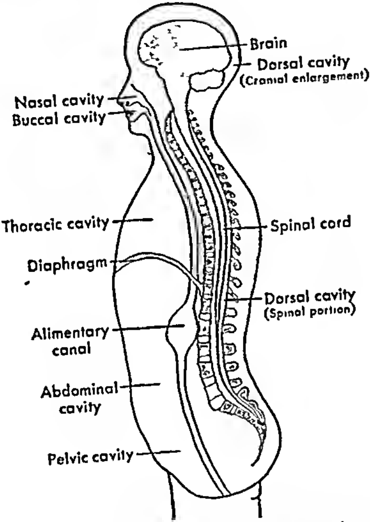



FIG 2 Diagram of a longitudinal section to show dorsal and ventral body cavities (Kimber, Diana C, Gray, Carolyn E, Stackpole, Caroline E, and Leavell, Lutie C *Textbook of Anatomy and Physiology*, 13th ed The Macmillan Company, New York, 1955)

## SYSTEMS

Several organs grouped together to perform certain functions are called a system One organ may have more than one function, and it may serve several systems. For example, the lungs have both

a respiratory and an excretory function; therefore, they serve both the respiratory and excretory systems.

We may say, for simplicity's sake, that there are nine main body systems, but we should remember that an organ may have more than one job to perform and that each system is interrelated to other systems.

The skeletal system. The skeletal system consists of the bones, which form a framework and support the body.

The muscular system. The muscular system consists of the muscles, which are attached to the bones and make possible the motion of the body.

The circulatory system. The circulatory system consists of the heart, arteries, veins, blood, lymphatic vessels, and lymph. The work of this system is to carry food and oxygen and other necessary fluids to all cells of the body.

The digestive system. The digestive system consists of the mouth, esophagus, stomach, large and small intestines, salivary glands, liver, and pancreas. This system takes care of the digestion and absorption of food.

The respiratory system. The respiratory system consists of the nose, larynx, trachea, bronchi, and lungs. This system provides oxygen to the body and gets rid of carbon dioxide.

The excretory system. The excretory system includes chiefly the urinary system, along with the digestive and respiratory systems and the skin. It eliminates liquid waste products from the body.

The urinary system consists of the kidneys, ureters, bladder, and urethra.

The reproductive system. The female organs of reproduction consist of the uterus, Fallopian tubes, ovaries, and vagina. The male organs consist of the testes, penis, and scrotum. The function of the reproductive system is to bring new life into the world.

The endocrine system. The endocrine system consists of the ductless glands located in various parts of the body. These glands regulate growth, function, and reproduction. They secrete substances directly into the blood stream.

The nervous system. The nervous system consists of the brain, spinal cord, and nerves which receive sensations and make the various body systems respond in an effective manner.

## *SUMMARY*

The body may be compared to a community in which every unit cooperates Its cells are joined into tissues, its tissues into organs, and the organs into systems

Although the cells are microscopic and differ in shape, size, and function, each cell has three essential parts New cells are made, and old ones die and are constantly replaced

Cells are bathed in lymph, which passes to the spaces between the cells from the blood stream

Each type of tissue performs a special task, and each is found in nearly every organ

Organs which work together form a system, but some organs serve more than one system

The nine main body systems are the skeletal, the muscular, the circulatory, the digestive, the respiratory, the excretory, the reproductive, the endocrine, and the nervous

### Questions

1 How is the body organized?
2 What are the three essential parts of a cell?
3 What kinds of tissue make up an organ?
4 What do we call a group of organs which function together?
5 What are the parts of the digestive system?
6 What are the parts of the respiratory system?
7 What systems work together to excrete liquid wastes?
8 What is the function of the reproductive system?
9 Of what is the endocrine system made up?
10 What are the three principal parts of the nervous system?
11 Consult the Glossary for the meaning of the following broncho , cardiac, gastro hemo , myo-, nucleus, serous

# 6

# EPITHELIAL TISSUE

Before beginning the study of the various systems, we should learn something about the epithelial tissue, which, in the form of skin, covers the outside of the body and, in the form of mucous membrane, lines all the cavities of the body.

The skin is composed of two layers, a thin outer layer of flat, hard cells called the epidermis, and a deep underlayer called the true skin, or dermis.

The epidermis, easily separable from the dermis, is that portion of skin raised by an ordinary blister. Its chief function is to protect the true skin underneath. It has very little sensation, but the true skin is very sensitive because of the presence of many delicate nerve endings. In the epidermis new cells are constantly produced to take the place of other cells which are pushed to the surface and finally shed. This process of shedding the superficial dry scales or cells is helped by the rubbing of clothing and the friction of bathing. Layers of these dead cells are seen when any covering such as a plaster cast, worn for a long time, is removed from the body.

The dermis, or the true skin, is filled with a network of nerves and blood vessels and contains many oil glands and millions of sweat glands.

The sweat, or sudoriferous, glands are little tubes ending in coils lying deep in the dermis. An outlet or duct runs spirally to the sur-

face and ends in an opening called a pore. If the sweat glands were put end to end, they would reach many miles. The sweat glands take up water and waste products from the blood and force them out on the surface of the skin in the form of perspiration. The normal amount of perspiration excreted in twenty-four hours is about one

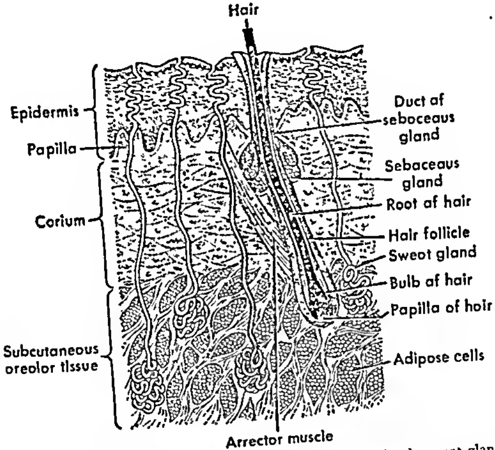



FIG 3 Vertical section of the skin, showing sebaceous glands, sweat glands, hair and follicle, also arrector muscle. (Gerrish ) (Kimber, Diana C ; Gray, Carolyn E.; Stackpole, Caroline E.; and Leavell, Lutie C : *Textbook of Anatomy and Physiology*, 13th ed The Macmillan Company, New York, 1955 )

quart. The sweat glands help in regulating the body temperature. When the surrounding air is warmer than the body, the blood vessels of the skin dilate, free perspiration takes place, and by the evaporation of perspiration the body becomes cooler. If the air is full of moisture, evaporation of the perspiration is difficult. Humidity causes more discomfort than dry air.

Sweat glands can be clogged by accumulation of the wastes which they should excrete.

**Oil glands.** The oil, or *sebaceous*, glands look like small sacs and are nearer the surface of the skin than the sweat glands. Most of these glands are located at the root of a hair and open into the depression in the skin, called a *follicle*, which contains the hair. The oil glands secrete a greasy substance which lubricates the skin and keeps it soft and pliable. When the openings of these glands are clogged with dirt, they become distended with oily material, and this predisposes the skin to a condition called acne. (See Chap. 43, "Some Diseases of the Skin.")

**Nerves of the skin.** The tiny nerve endings in the skin give the sense of touch. They are more highly developed in some parts of the body than in others. The tips of the fingers are especially sensitive.

**Hair** is also a growth of the epidermis and is made up of countless cells arranged in a column. The part of the hair in the follicle is called the root.

**Nails** are an outgrowth of the epidermis composed of dry hard cells packed tightly together. The nails act as a protection to the tips of the fingers and toes and aid in picking up objects.

**Mucous membrane** is another form of epithelial tissue. It lines all the cavities of the body which communicate with the exterior and secretes a fluid called mucus, which coats and protects the surface of the membrane.

**Secretions and excretions** are substances formed by the cells of the body. The difference between them is that the secretion is intended for use in the body and the excretion is generally formed to be thrown out of the body.

**Glands** are composed of epithelial tissue and secrete certain fluids necessary to the body. Many glands lie along the alimentary canal. The fluids they secrete aid in the digestion of food. For example, the gland called the liver secretes bile, the salivary glands secrete saliva, the gland called the pancreas secretes pancreatic juice, and the stomach secretes gastric juice. These glands are provided with ducts which convey their secretions into the alimentary canal.

They should not be confused with the endocrine glands, which have no ducts and pass their secretions directly into the blood stream.

## *SUMMARY*

The body is covered by the skin, composed of two principal layers the epidermis and the dermis The flat, hard layers of tissue in the epidermis protect the body They are modified to form the hair, nails, and the mucous membrane The dermis, or true skin, is a network of nerves and small blood vessels and in addition contains a great many sweat and oil glands Body fluids are secreted in glands, which are sacs formed of epithelial tissue

The numerous blood vessels in the dermis provide nourishment to the skin The nerves are necessary to give us our sense of touch The sweat glands bring both water and wastes to the surface of the body In thus functioning, they assist in the regulation of body temperature and in the excretion of wastes The secretion of the oil glands keeps the skin soft and pliable

### Questions

1 Under ordinary conditions how much perspiration is eliminated through the skin daily?
2 Why is a person uncomfortable in hot, humid weather?
3 By what process does the perspiration help to regulate the temperature of the body?
4 Name the appendages of the skin
5 What membrane lines the passageways of the body which lead to the exterior?
6 Try to find out what two surfaces of the body have many sweat glands, yet few oil glands
7 Consult the Glossary to learn the meaning of allergy, cutaneous, demulcent, derm-, fungus, membrane, pallor

# 7

# THE SKELETAL SYSTEM

## *GENERAL DESCRIPTION*

The human skeleton is composed of many different bones attached to each other by movable joints and fibrous ligaments. The way the skeleton is built provides both protection and support for the less rigid and more fragile body organs. Muscles attached to these bones produce locomotion, or movement of the body as a whole, and permit skilled movement in specialized parts. Man's skeleton allows him to assume a habitually vertical posture and to develop skill with his hands.

### COMPOSITION AND DEVELOPMENT OF BONE

Bones are made of microscopic cells, just as are the other tissues of the body. As the body is formed in the uterus, specialized soft bone tissue develops. This tissue has a definite cell structure which provides a framework suitable for the deposit of mineral salts.

Bone strength depends upon the orderly deposit and use of calcium and phosphorus salts which are obtained from the diet, mostly from milk products. These salts are absorbed from the intestines and are deposited in growing bone under the stimulus of vitamin D and a hormone or secretion from the parathyroid glands in the neck. A lack of calcium in the diet or of the stimulating regulators mentioned will prevent strong bones from forming. Although

the growth of bone is most marked in early life, the hardening process continues through the years.

Some bones go from the soft stage through an intermediate stage, in which they are composed of *cartilage* before they become hard or calcified. The outside of the ear and the end of the nose remain in the cartilage stage, covered with skin.

Since the ends of the "long bones," as those of the limbs are called, have progressed only to the cartilage stage at birth, they can become longer as the child grows. By gradual deposits of mineral salts, the long bones become completely calcified at about the age of twenty. When a bone is broken, it goes through the same stages in the process of healing as it did in its development, but it requires a much shorter time.

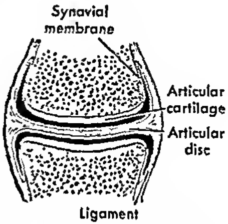



FIG 4 Diagram of a section of a movable joint with an articular disc of cartilage (After Gray's *Anatomy*) (Kimber, Diana C , Gray, Carolyn E , Stackpole, Caroline E , and Leavell, Lutie C · *Textbook of Anatomy and Physiology*, 13th ed The Macmillan Company, New York, 1955 )

Structure of bones. The long bones of the arms and legs, and the flat bones of the skull and pelvis have an outer hard shell and an inner soft marrow which is the source of new blood cells. To have additional strength, the long bones have a more solid inner marrow at each end. The shell of the bone is covered by a thin layer of tissue called the *periosteum*, which contains cells capable of making new bone.

Types of joints. Junctions between bones are called joints. Some joints are shaped to allow more movement than others, varying from small amounts, such as the gliding motion between the vertebrae, to free movement in any direction, such as the universal or ball-and-socket joint at the shoulder or hip. The knee and finger joints, whose shape allows motion backward and forward only, are called hinge joints.

Structure of joints. Around the edges of the joints, the bones are held together by very firm strong bands of tissue known as ligaments. Where the surfaces of the ends of the bones come together,

they are covered with a thin layer of cartilage, which is smoother than the bone, thus permitting the joint to move easily. The cartilage is covered with *synovial membrane*, a tissue which secretes a small amount of slippery fluid to keep the joints lubricated so that they can move without friction. Since the cartilage is softer than bone, it takes up or absorbs the shocks and jars of body motions.

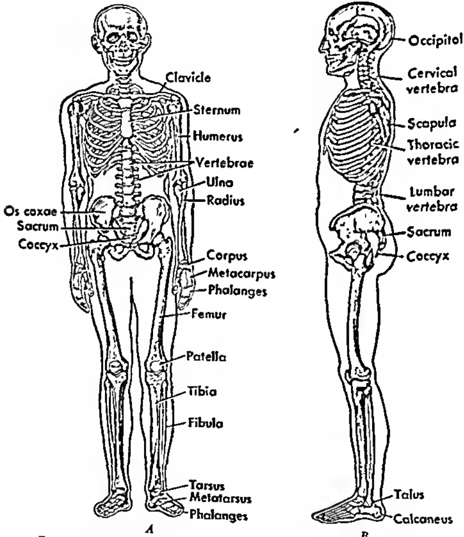



FIG. 5. The human skeleton. *A*, front view; *B*, side view. (Kimber, Diana C.; Gray, Carolyn E.; Stackpole, Caroline E.; and Leavell, Lutie C.: *Textbook of Anatomy and Physiology*, 13th ed The Macmillan Company, New York, 1955.)

## THE SKELETON

The 206 bones in the adult body are distributed as follows

| | | |
|---|---|---|
| Skull | 22 | |
| Ears | 6 | |
| Hyoid | 1 | |
| Shoulder girdle | 4 | |
| Ribs and sternum | 25 | |
| Vertebral column | 26 | (Adult) |
| Pelvis | 2 | |
| Upper extermities | 60 | |
| Lower extremities | 60 | |
| Total | 206 | |

The skull The bones of the cranium, most of which are thin and flat, begin to develop in the very early stages of the infant's life Ossification (hardening of the bones) is not complete at birth, hence, membrane filled spaces are found between the bones These spaces are called fontanels

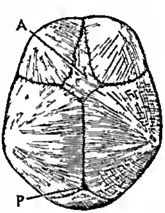



Fig 6 Skull of new born infant seen from above *A* anterior fontanel *P* posterior fontanel (Toldt.) (Kimber Diana C Cray Carolyn E Stackpole Caroline E and Leavell Lutie C *Textbook of Anatomy and Physiology*, 13th ed The Macmillan Company New York, 1955 )

The skull, on the upper end of the vertebral column, consists of 22 bones These form two groups *cranial* and *facial* They are joined firmly together except for the hinge joint which allows the chewing motion of the lower jaw, or *mandible* The upper jaw, or *maxilla*, is firmly attached The teeth are embedded in the bones of the upper and lower jaws The delicate sense organs of the eye and ear are protected in bony cavities in the skull, which also protects the brain The flat bones contain air filled sacs, or *sinuses*, around the ear and nose The sinuses are part of the respiratory system

The ear bones The middle ear contains three small bones which articulate with each other the hammer, or *malleus*, the anvil, or *incus*, and the stirrup, or *stapes* They conduct sound waves to the middle ear (See Chap 16, "Anatomy and Physiology of Eye and Ear")

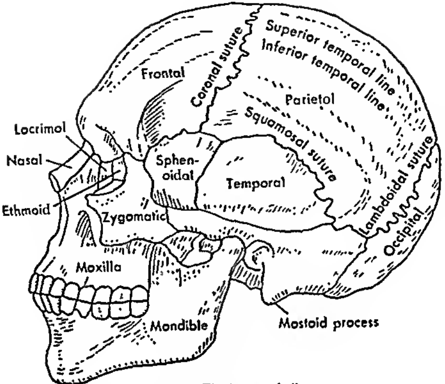



FIG. 7. The human skull.

**The hyoid bone.** The hyoid is a small U-shaped bone, situated in the neck, just above the Adam's apple. It supports the tongue and serves as an attachment for the muscles of the tongue, used in speaking and swallowing.

**The shoulder girdle.** The shoulder girdle consists of the two flat shoulder blades, or *scapulae,* and the supporting collarbones, or *clavicles,* one on each side. These bones are attached by strong muscles to the rib cage, as well as to each other. By their motion they help to provide for the great range of action of the arms.

THE CLAVICLES. The clavicles are two small thin bones connected at one end to the breastbone, or sternum, and at the other end to the shoulder blades or scapulae.

THE SCAPULAE. The scapulae are small, flat triangular bones with a smooth, slightly hollowed surface to allow easy movement of the ribs in breathing. The back of the scapula is rough, and its upper part is crossed by a prominent ridge to which powerful neck and arm muscles are attached.

The sternum, or breastbone, is a long, flat bone located at the medial line at the front of the chest. The sternum is about 6 inches long and has notches along its edges to receive the ends of the ribs.

The ribs. The 12 ribs of each side are attached in back, or posteriorly, to the 12 vertebrae in the chest region. The upper seven

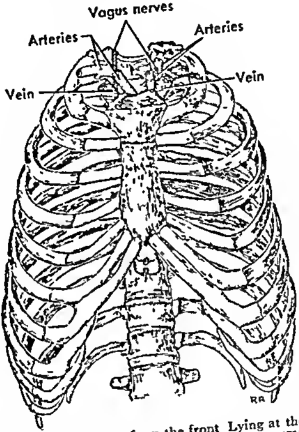



FIG 8 Bones of the thorax, seen from the front Lying at the top of the "thoracic basket," note vagus nerves, arteries, veins (Toldt) (Kimber, Diana C, Gray, Carolyn E; Stackpole, Caroline E., and Leavell, Lutie C: *Textbook of Anatomy and Physiology*, 13th ed. The Macmillan Company, New York, 1955)

ribs are attached in front, or anteriorly, to the breastbone, or sternum. The eighth, ninth, and tenth ribs are attached anteriorly by cartilage to the rib above. The eleventh and twelfth, called floating ribs, are not attached in front. This movable thoracic cage of ribs forms a bony protection for the heart, large blood vessels, and lungs.

The spinal column, or vertebrae. The spinal column is the main upright support of the body. In youth, the vertebrae are 33 in number:

| | | |
|---|---|---|
| Cervical, in the neck | 7 | Movable, or true, vertebrae |
| Thoracic, or dorsal, in the thorax | 12 | |
| Lumbar, in the loins | 5 | |
| Sacral, in the pelvis | 5 | Fixed, or false, vertebrae |
| Coccygeal, in the pelvis | 4 | |

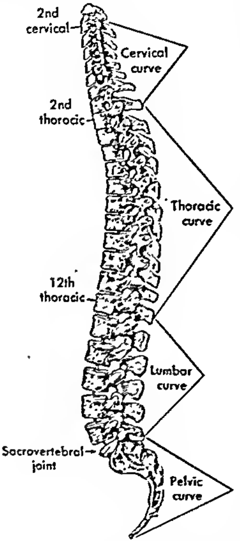



Fig. 9. The vertebral, or spinal, column. Right lateral view. (Kimber, Diana C.; Gray, Carolyn E.; Stackpole, Caroline E.; and Leavell, Lutie C.: *Textbook of Anatomy and Physiology*, 12th ed. The Macmillan Company, New York, 1948.)

The sacral and coccygeal vertebrae fuse, and in the adult they become the sacrum and the coccyx. In the adult the vertebrae number 26. The 24 movable or true vertebrae have closely fitting joints which allow a gliding motion. Each vertebra has a hole in the center. When these bones are in line, the holes come opposite each other, forming a long tube which houses and protects the spinal cord.

The backbone, or spinal column, is often described as if it contained three portions: (1) the upper or cervical portion, which corresponds to the neck and on which the skull rests; (2) the thoracic portion, to which the ribs are attached; and (3) the lower or lumbar portion, where the vertebrae are somewhat heavier because they have more weight to bear.

At the end of the spinal column is the *sacrum,* a somewhat flat shield-shaped bone. Projecting downward

from the sacrum is a small bone, the *coccyx*. Because these bones in the lumbar portion are without joints, they are called fixed vertebrae. The coccyx is all that remains of the tail of prehistoric man.

A side view of the spine shows that it has four curves: cervical, thoracic, lumbar, and sacral. These curves help one to maintain balance when standing erect and also serve as shock absorbers.

The pelvis. The pelvis, or pelvic girdle, consists of the flat sacrum in back and the two wing-shaped hipbones, one on each side, which are connected to the sacrum on each side and are joined to each other in front. The bones are fused firmly together to form a hollow bony basin, the floor of which is composed of muscles. The lower end of each hipbone has a socket on its outer side into which fits the ball-like head of the thighbone, or femur. The pelvis provides a bony cage for the urinary, reproductive, and intestinal organs.

The arm bones. The ball-like head of the upper arm bone, or *humerus*, fits into the socket of the shoulder blades, or scapula. The humerus is the longest bone of the upper extermity. At the lower end of this bone, the two bones of the forearm, the *radius* and the *ulna*, join to form the elbow joint. The bones of the forearm not only move at the elbow but rotate on each other, thus permitting skilled motions of the hand. The lower ends of the radius and the ulna can be felt as the two wristbones.

The hand. The 27 bones of the hand, with their many joints, have the ability to grasp tightly even small objects by pressing the thumb against the other fingers. The wrist is formed by 8 *carpal* bones. The palm of the hand contains 5 *metacarpal* bones, together with 14 *phalanges* or finger bones, three in each finger and two in each thumb.

The leg bones. The leg bones consist of the *femur* in the thigh, and the *tibia* and *fibula* in the lower leg, between the knee and the ankle. The larger of the bones in the lower leg is the tibia, or shinbone. It is joined by ligaments to the thighbone, or femur, at the knee joint. Just in front of the knee joint is a small bone, the kneecap, or *patella*. The patella protects the front of the knee joint when the knee is bent. The rather slim bone parallel to the tibia is the fibula, or calf-bone. This bone helps in the formation of the ankle joint. The ends of both the tibia and the fibula extend down on each side of the ankle joint—the tibia on the big-toe side, the fibula on the little-toe side.

These bones are constructed to bear weight. They have strong joints, particularly the femur, or thighbone, which has at its upper end a rounded head fitting into the socket of the hipbone.

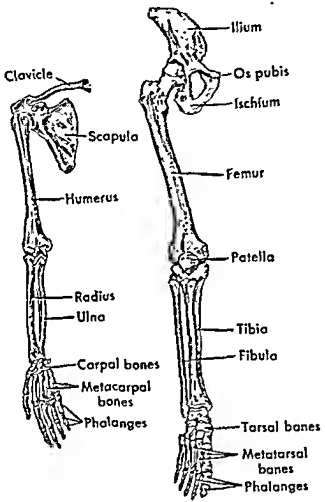



FIG. 10 Comparison of bones of the upper and lower extremity (Toldt.) (*Kimber, Diana C.; Gray, Carolyn E., Stackpole, Caroline E.; and Leavell, Lutie C.: Textbook of Anatomy and Physiology*, 13th ed The Macmillan Company, New York, 1955)

The foot. There are 26 small bones in the foot: 7 ankle or *tarsal* bones, 5 *metatarsal* bones (forming the instep and sole), and 14 phalanges in the toes. The foot has two arches: (1) the longitudinal arch which runs the length of the foot and (2) the trans-

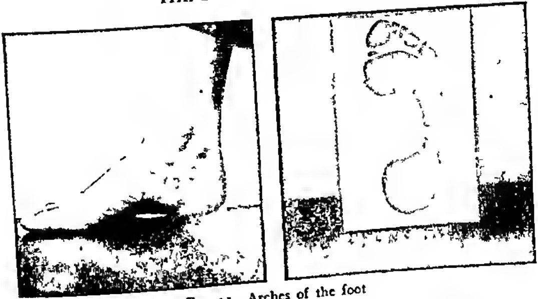


Fig 11 Arches of the foot

verse arch across its greatest width to allow a springlike action in weight-bearing.

## SUMMARY

The 206 bones in the body, which form the skeleton, are attached to each other by movable joints and fibrous ligaments. The principal functions of the skeleton are to protect and support the body, which as a whole and in its parts, is enabled to have the power of locomotion by means of muscles attached to the bones.

Two outstanding characteristics of the human skeleton are (1) that it permits man habitually to assume a vertical, upright posture, and (2) that it allows marked manual dexterity.

Bone tissue has a definite cell structure which provides for deposits of calcium salts, essential to bone growth and strength. Some bones go through an intermediate stage of cartilage. The long bones and the flat bones have hard outer shells covered with a thin layer, the periosteum, and an inner soft marrow, the source of new blood cells

The joints are held together by strong ligaments. Variations in joints allow for difference in movement. The joints are lubricated by a fluid secreted by the synovial membrane.

The main bones and groups of bones of the skeleton comprise:

the skull, the ears, the hyoid, the shoulder girdle (the clavicles and scapulae), the sternum, the ribs, the vertebrae, the pelvis, the arm bones, the hands, the leg bones, and the feet.

## Questions

1. List the functions of the skeletal system.
2. Discuss the variations in the size and shape of bones.
3. Discuss the composition and development of bone.
4. What minerals are necessary for bone growth? What foods are the best source of minerals?
5. Draw a diagram to show the structure of a long bone.
6. What structure is essential for the regeneration of bone cells?
7. In lifting a book, what joint or joints would be used?
8. How many bones are there in the skull?
9. Does the process of ossification or calcification start before or following birth?
10. List both the common and anatomical names of the skeletal bones.
11. Name and locate the arches of the foot.
12. What does the marrow manufacture?
13. Consult the Glossary for the meaning of the following: osseous, osteo-, phalanges, rigid, suture, tarsus.

# 8

# THE MUSCULAR SYSTEM

Muscles not only provide the force which moves the skeleton but they also supply support for the body organs. They keep the body erect, and they aid the body cavities in holding in position the organs which they enclose. Muscles are of various sizes and shapes, according to the work they perform.

## *TYPES OF MUSCLES*

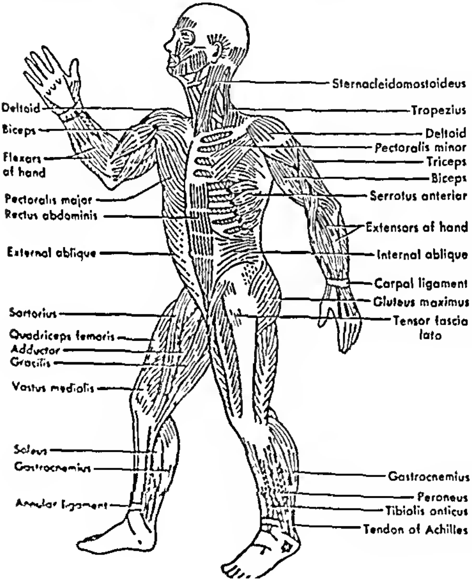
Muscles are of two kinds: (1) voluntary muscles, attached to the skeleton, which are under the control of the will, and (2) involuntary, smooth muscles, which make up the walls of the body organs, which are not under control of the will.

### SKELETAL MUSCLE

Although we do not realize it, nearly every movement of our skeletal muscles is preceded by a thought process which sends a message from the brain down to the nerves of the muscles, by way of the spinal cord and motor nerves. For instance, if we desire to move our legs or arms, we may do so, and if we desire to stop moving them, we may do that, too. When a muscle receives the impulse,

each muscle fiber contracts, making the whole muscle not only shorter but thicker.

If a nerve is killed, no impulse is carried to the muscle. It is therefore unable to contract, or, as we say, it is paralyzed.



**Structure of a muscle.** A typical skeletal muscle has a central portion known as the muscle belly, which is composed of muscle tissue, that is, muscle cells held together in bundles by connective tissue The two ends of the muscle are made of strong fibrous tissue called *tendons* which attach the muscles to the bones

**Attachment of muscles to bones** A muscle is usually attached by its tendon at one end to a bone which remains stationary while the muscle acts This point of attachment is called its *origin* At the other end of the muscle is an attachment which moves when the muscle acts This point is called its *insertion* The muscle can pull on the two bones to which it is attached as directed by the brain, causing the bones to change their position or flex at the joints between them Thus, when the muscle of the upper arm contracts, the scapula from which it arises remains practically still, but the forearm into which it is inserted is pulled upward as the muscle shortens, and the arm consequently is bent at the elbow

Besides providing a firm attachment to bones, the tendons also allow the necessary sliding motion when the muscle contracts For instance, when one makes a fist, the forearm muscle bellies shorten and become wider, and at the same time, the tendons slide in their sheaths to bend the fingers This sliding can be felt at the wrist

**Muscle function** As the muscles perform work, they require fuel The burning of this fuel provides energy for muscle contraction Fuel in its simplest form, sugar, or glucose, is brought to the muscle by means of the blood stream Oxygen, also carried by the blood stream, helps the muscle burn this sugar to produce energy for muscle use

Lactic acid is formed as the "ashes," or breakdown, of this burned sugar During prolonged exercise, lactic acid accumulates until the blood stream removes it from the muscle The acid can be removed from the blood stream by the lungs and kidneys at a certain rate only When that rate is exceeded, the amount of acid increases, and fatigue results This accumulation of acid is the greatest factor in causing muscle fatigue, which results in the muscle's contracting less and less efficiently until it has had a sufficient amount of rest While it is at ease, the accumulated lactic acid is carried away by the circulation, and a fresh supply of glucose is brought to it Then it can contract again as well as ever

## INDIVIDUAL MUSCLE GROUPS

To study individual muscles would take a good deal of time and knowledge; but since individual muscles work together in harmony, they are said to be coordinated and can be studied in groups.

**Flexors and extensors.** To understand something about the muscles of the extremities—that is, the arms and legs—one should be familiar with a few of the terms used in describing muscle groups.

Muscles which bend a hinge joint to make the angle of that joint narrower are called *flexors.* Those muscles which straighten a hingle joint are called *extensors.* The corresponding motions are called flexion and extension.

At a universal joint, forward motion is called flexion; backward motion, extension. Motion away from the trunk is called *abduction,* and motion toward the mid-line is called *adduction.*

For every group of muscles causing a given motion, there is a group causing the opposite motion. The essential action of all muscles is the same. The result of their contraction depends upon the bones to which they are attached and upon the type of joints formed by those bones.

**Muscles of shoulder.** The shoulder girdle has such an insignificant bony attachment to the trunk that strong muscles are necessary to keep it firmly in place. The largest of these is the *trapezius* muscle. This is a large fan-shaped muscle, one end of which is attached all along the spine from the base of the skull down to the lumbar vertebrae, and the other end to the prominent ridge of the scapula and to the clavicle. In front the shoulder girdle is attached to the trunk by means of the *pectoral,* or chest, muscles, which are attached to the ribs, the clavicles, and the humeri. These muscles cause various motions at the shoulder joints and act, as well, as attachments of the shoulder girdle to the trunk. Of the muscles moving the shoulder but not attached to the trunk, the most important is the *deltoid.* This is a large muscle attached to the scapula and clavicle above and to the humerus below. It covers the top of the shoulder joint, and, when it contracts, it abducts the arm. Intervening between it and the joint is a sac lined with a tissue that secretes a small amount of lubricating fluid. This sac, called a *bursa,* occasionally becomes inflamed, thus causing a painful but not serious condition known as *bursitis.*

**Muscles of the arm and hand.** The muscles which move the elbow joint are of two groups, flexors and extensors The flexors are larger and more powerful than the extensors because they have more work to do The most important flexor is the *biceps* This is on the front of the upper arm and can be felt to contract when the elbow is bent The muscles of the forearm are concerned in motions of the wrist, in twisting the forearm, and in motions of the fingers The muscle-bellies of the main flexors and extensors of the fingers are situated in the forearm and have long tendons extending to the fingers These tendons are enclosed through part of their extent in lubricated sacs known as *tendon sheaths* If the sac should become infected, the lubricating action would be diminished or destroyed, and the motion of the fingers would then be greatly hindered

**Muscles of respiration.** The exchange of air in the lungs—breathing—is carried out mostly by muscles between the ribs and the muscles of the abdomen The main muscle of respiration is the dome-shaped *diaphragm*, which forms the floor of the chest, or *thoracic cavity* The diaphragm is attached to the spinal column in back, to the sternum in front, and to the ribs on the sides It has three openings through which pass two large blood vessels and the esophagus (that part of the digestive tract between the throat and the stomach)

When the diaphragm contracts, it tends to flatten its dome, and as it descends toward the abdomen, it increases the size of the chest cavity In this way it produces lung expansion and the breathing in, or *inspiration*, of air While the muscular portion of the diaphragm is contracting, the abdominal walls are relaxing to allow more room for it, and when the diaphram relaxes, the abdominal walls contract As the chest cavity becomes smaller, the air is forced out of the lungs This outgoing of air is called *expiration*

The diaphragm is assisted in making the thoracic cavity larger by other muscles of respiration Besides the abdominal muscles there are the muscles of the ribs, or the intercostal muscles, which fill the spaces between the ribs and have their origins in the ribs above and their insertion in the ribs below They help to enlarge the chest cavity from front to back

Respiration, or breathing, is regulated by the respiratory center of the brain in response to the body's needs When it becomes un-

regulated or uncoordinated, hiccups, or spasmodic movements of the diaphragm, are likely to result.

**Abdominal muscles.** The muscles of the abdominal wall consist of overlapping strips or layers, which have their origin in the ribs and their insertion in the pelvis These muscles assist in respiration and also support the abdominal organs At their points of insertion,

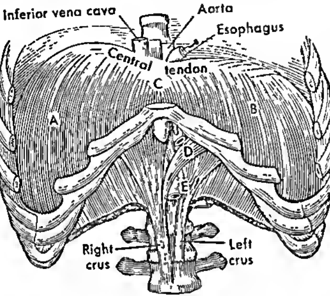



Fig 13 Diaphragm, viewed from the front At *A* the liver and at *B* the cardiac end of the stomach are underneath the diaphragm and push it up; at *C* the tip of the heart pushes the diaphragm down At *D* and *E* the esophagus and aorta are shown (Gerrish ) (Kimber, Diana C , Gray, Carolyn E , Stackpole, Caroline E , and Leavell, Lutie C · *Textbook of Anatomy and Physiology,* 13th ed The Macmillan Company, New York, 1955 )

they are composed mainly of tendon. They have openings to provide for the passage of blood vessels and nerves to the legs. Under some circumstances, a loop of intestine may be forced through these openings in the muscular walls of the abdomen. This condition is known as a rupture.

**Vertebral and back muscles.** These muscles lie along the vertebrae and form the heavy muscle-belly which helps to hold the vertebrae in a vertical position. This group of muscles is constantly at work when we stand. They are attached to the outer flat surface of the hipbone and to the femur. They extend and rotate the hip-

bone. Flexion or bending of the hipbone is accomplished mainly by a group of muscles which have their origin in the spine and inner surface of the pelvic bone and their insertion in the femur.

The motion of the femur, or thighbone, at the hip joint is produced by the *gluteal muscles*. This group of muscles is constantly used in sitting, standing, climbing, and walking. The muscles are covered by a pad of fat to form the buttocks, upon which we sit.

**Muscles of the leg.** The muscles which bend or flex the leg at the knee are situated at the back of the thigh and are known as the *hamstring group*. These muscles and their tendons give much strength to the knee.

The extensor group is on the front of the thigh and is called the *quadriceps*. These muscles come together into a single tendon which covers the front of the knee joint. This tendon is inserted in the tibia. In this tendon is located the *patella*, or kneecap.

Another group of muscles arises from the crest of the hipbone and is attached to the tibia. Since its action is to pull the thigh forward, toward the mid line, thus pulling the legs together, it is called the *adductor group*.

The calf muscles which lift the heel also form a very strong common tendon known as the *Achilles tendon*. It has its insertion in the heel bone. These muscles flex the foot down so that one may rise on the toes.

The muscles which raise the toes are on the outer part of the leg, in front. Many small muscles in the foot assist in walking.

## SMOOTH MUSCLE

The muscle found in the various organs of the body is somewhat different in structure from that of the voluntary muscle. It is known as smooth or involuntary muscle. We cannot stop the movements caused by the muscles in our internal organs by wishing to do so, for the action of smooth muscle is not under the control of the will. Involuntary muscle carries on its work independently of any thought process and is controlled by reflexes (described in Chap. 15, "The Nervous System"). The narrowing of the pupil of the eye when a strong light strikes it or the wavelike movement of the intestine as food is pushed through it are good examples of involuntary muscle contraction.

## SUMMARY

Muscles provide the force which moves the bony skeleton and body organs. Besides, they keep the body erect and aid the body cavities to hold adjacent organs in place.

Muscles are classified as voluntary (striated) and involuntary (smooth).

Smooth, coordinated movement in the skeletal muscles is brought about by the nervous system. Upon stimulation, the muscle contracts and thickens, thereby pulling on the bones to which its ends are attached, causing movement at the joints. The ends of the muscles are strong, smooth tendons which hold fast yet permit the essential sliding motion when the muscle contracts. The relatively fixed end of the muscle attachment is called its origin, while the end where the greatest movement takes place is its insertion.

The fuel required for muscle energy is body sugar, which, with the necessary oxygen for burning, is brought to the muscle by the blood. The "ashes" resulting from this combustion consists of lactic acid, which is removed from the body as fast as possible by the lungs and kidneys. When it is produced so rapidly that it accumulates in the system, it causes fatigue.

Muscles coordinate in groups. The chief muscle groups are divided as follows: muscles of the shoulder and upper arm, muscles of respiration, abdominal muscles, vertebral and back muscles, pelvic and upper leg muscles, muscles of the hand, and leg muscles.

### Questions

1. What are bursae and where are they located?
2. Explain flexion, extension, abduction, and adduction.
3. What ash is the end material of muscular work?
4. How does a muscle obtain its pull?
5. How are muscles attached to bones?
6. List the muscles used in walking.
7. What muscle groups are controlled by the will?
8. Where are the muscles located which move the fingers?
9. What is the most important function of the muscular system?
10. What is the meaning of ***antagonistic*** as it relates to muscles?
11. Discuss fatigue in relation to muscles.
12. Describe a typical muscle.

# 9

# THE CIRCULATORY SYSTEM

Body cells need oxygen and food in order to live There must therefore be some mechanism by which food and oxygen can be brought to them and waste products carried away Such a mechanism is the circulatory system, consisting of the blood, the lymph, and the channels through which they flow

## *THE BLOOD*

Although the blood is in liquid form, it is a living tissue and, like any other, consists of cells and the substance between them In the blood the intercellular substance is a fluid called *plasma* The exact amount of blood in the body is estimated to be about one-twentieth of the body weight

Red cells The red color is given to the blood by the red cells, or *erythrocytes* The coloring matter in the cells is known as *hemoglobin* It is a complex substance containing iron and a protein called *globin* Hemoglobin absorbs oxygen as the blood circulates through the lungs It delivers the oxygen to all the organs and tissues of the body As it gives up oxygen to the various tissue cells, it receives and carries away carbon dioxide, which in turn is removed from the blood by the lungs Other waste products are carried by the blood to the kidneys

White cells. The blood contains another type of cell called the white cell, or *leucocyte*. It contains no hemoglobin. Although there are several kinds of white cells, all serve to protect the body against various injurious agents. When certain organisms enter the body, the white cells increase in number and are carried to the site of the infection, where they play a part in limiting and overcoming the infectious reaction or inflammation.

Clotting of blood. Blood needs to be very adaptable. To perform its task, it must remain fluid as long as it stays in the blood vessels. If, however, a blood vessel becomes cut or torn, just enough of the blood to stop the hole through which the blood is being lost must become solid very rapidly. This property of the blood to become solid at the point of injury to a blood vessel is called clotting, or *coagulation*.

Platelets. Besides the red and the white blood cells, there are still other formed elements in the blood called platelets, or *thrombocytes*. Their function is not definitely understood, but they are necessary for the clotting of blood.

The blood plasma. The blood plasma is a yellowish fluid which contains in solution the various substances resulting from the digestion of food in the alimentary tract. It also contains a substance called *fibrinogen*, which forms the fibrin of the blood clot.

The exact way in which clotting occurs is not yet known, but we do know that certain conditions are necessary in order that it may occur normally. There must have been an injury to the blood vessels to start into action this remarkable lifesaving process. There must be present in the blood a sufficient number of platelets. The plasma must also contain a sufficient amount of calcium and fibrinogen; otherwise, clotting will not occur.

Blood serum. As the process of clotting becomes complete, a straw-colored fluid is separated from the solid clot. This fluid is known as blood serum.

Hemorrhage. Any considerable loss of blood outside the blood vessels is called a hemorrhage. When a large vessel is cut, the force of the blood coming from it may be so great that a blood clot cannot form, or something defective in the clotting mechanism may prevent it. Any large loss of blood is a serious matter, as not only the fluid balance of the body is markedly upset but also the loss of red cells deprives the tissues of sufficient oxygen.

## THE HEART

If the blood is to carry oxygen and foodstuffs to the cells of the body and then return to the lungs for more oxygen, there must be an engine to propel the blood, and channels in which it can flow The engine of the circulatory system is the heart, the channels are the blood vessels

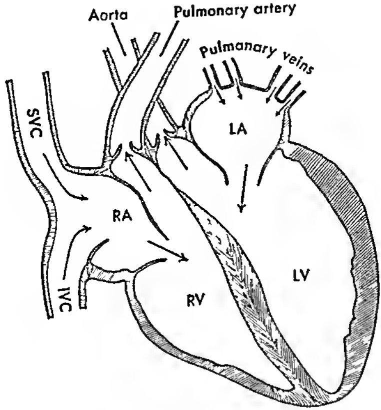



FIG 14 Diagram of heart showing the four chambers and the valves which guard their openings seen from the front The arrows indicate the direction of the blood flow (Kimber, Diana C , Gray, Carolyn E , Stackpole Caroline E , and Leavell, Lutie C *Textbook of Anatomy and Physiology* 13th ed The Macmillan Company New York 1955 )

The heart is a muscular organ enclosed in a lubricated sac called the *pericardium* It is situated in the thoracic cavity between the two lungs

**Chambers of the heart.** The heart is hollow and its cavity is divided into four spaces or chambers the right and left atria and

the right and left ventricles. These chambers are lined with a moist membrane called the *endocardium*. The muscular tissue of the heart is called the *myocardium*.

*The atria* may be considered as the receiving stations of the heart. The blood comes into the left atrium from the lungs and into the right atrium from the general circulation. When the atria contract, they force the blood into the ventricles.

*The ventricles* are the main pumps of the heart. Their walls are thicker than those of the atria. The contraction of their walls forces the blood out of the heart into the blood vessels.

The valves in the heart allow the blood to go from the left atrium to the left ventricle to be pumped through the *aorta* into general circulation; and on the other side, from the right atrium to the right ventricle, from which it is pumped through the pulmonary artery to the lungs. The beating of the heart is caused by the contraction of the heart muscle as it pumps the blood into the arteries.

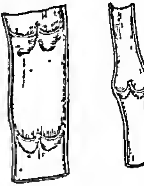
The valves. The opening between the right atrium and the right ventricle is called the *tricuspid* opening, and the valve, the tricuspid valve. On the left side of the heart, the opening between atrium and ventricle is called the *mitral* opening, and its valve, the mitral valve. There is normally no opening between the two atria nor between the two ventricles. These valves allow the blood to go from atrium to ventricle, but when the ventricle contracts, they are pushed shut by the blood in the ventricle and thus do not allow the blood to return to the atrium. There are also valves at the openings from the ventricles into the pulmonary artery and aorta to prevent the blood from flowing back into the heart when the heart relaxes between contractions.

## *THE BLOOD VESSELS*

Arteries. Arteries are tubes with thick walls composed of three layers: the inner, the middle, and the outer. The inner layer is smooth and shining. The middle layer is composed of muscle fibers encircling the artery and numerous other fibers called elastic fibers. These elastic fibers enable the artery to stretch with each beat of the heart, when a large amount of blood is forced into it. The outer

layer contains the small blood vessels which bring nourishment to the artery itself.

From each of these main arteries, the aorta and the pulmonary artery, branch off numerous other smaller arteries. Those from the pulmonary artery go to various portions of the lungs; those from the aorta go to all the rest of the body. Each branch artery has other branches from it. Each time an artery branches, it becomes smaller and its walls become thinner, although the general structure is the same as in the larger arteries.



A B

Fig 15 Diagram showing valves of veins *A*, part of a vein, laid open, with two pairs of valves; *B*, longitudinal section of vein, showing valves closed (Kimber, Diana C, Gray, Carolyn E, Stackpole, Caroline E, and Leavell, Lutie C.: *Textbook of Anatomy and Physiology*, 13th ed The Macmillan Company, New York, 1955)

All organs and other parts of the body have arteries to supply them with blood; even the heart muscle itself has its special supply brought to it by the *coronary arteries*, so called because they encircle the heart like a crown.

Capillaries. Finally, when the smallest arteries, called *arterioles*, branch, the branches lose the characteristic structure of the artery and are small channels with walls only one cell thick. These are the capillaries. In the capillaries the exchange of substances between the blood and the tissues takes place. The oxygen and foodstuffs diffuse from the blood to the tissues through the thin capillary wall, and carbon dioxide and waste products diffuse from the tissues to the blood.

Veins. After the blood has gone through the network of capillaries, it is collected in veins, first very tiny veins called *venules*, and then into larger and larger veins. The veins have the same structure as arteries except that their walls are thinner. Six large veins convey the blood to the heart. The *superior* and *inferior venae cavae* convey blood to the right atrium, and the *four pulmonary veins* convey blood to the left atrium. Branching off from these are smaller veins which usually accompany the arteries to the various organs. The veins carry blood to the heart and the arteries carry blood from the heart. While the force of the heartbeat is sufficient to propel the blood

through the arteries, a considerable amount of that force is lost by the time the blood reaches the capillaries, and the blood goes through them comparatively slowly. This force or pressure is therefore insufficient to take the blood back to the heart through the veins. Here it is squeezed along by all motions of the body, and the vein walls have valves in them to prevent the blood from flowing away from the heart.

## *THE CIRCULATION OF THE BLOOD*

Let us follow a drop of blood in the left ventricle of the heart and see how it completes its circuit and returns to the heart again. With the contraction of the heart, it is pushed out through the open aortic valve into the aorta. From there it may go through one of the branches leading to an abdominal organ. Here it will follow the smaller and smaller arterial branches until, from one of the *arterioles*, it will enter a capillary. Here it will lose some of its oxygen and pick up some waste products, and carbon dioxide. From the capillary it will go through a tiny venule and then through larger and larger veins until it reaches the inferior vena cava. From there it enters the right atrium of the heart while the heart is relaxed. When the heart contracts, the atrium contracts first and forces the blood through the tricuspid opening into the right ventricle. The ventricle then contracts, the valve is closed, and our drop of blood, still lacking its full amount of oxygen and containing an excess of carbon dioxide, is forced through the pulmonary valve opening into the pulmonary artery. From here it enters a branch going to either the right or left lung, and then it goes through smaller and smaller branches until it enters a capillary. In the lung capillary it comes in contact with the air in the lungs, loses its carbon dioxide, becomes saturated with oxygen, and then enters a small pulmonary venule. From there it goes through larger and larger veins until it enters one of the four large pulmonary veins which carries it to the left atrium. When the atrium contracts, the blood is pushed through the mitral opening into the left ventricle and is ready to begin its journey again.

**Rate of blood flow.** The amount of time a drop of blood takes to complete its journey is known as the rate of blood flow. It takes about 20 seconds for a drop of blood to go from the left ventricle

back to the right atrium. In certain diseases of the heart, this rate of flow may be changed so that it is much slower. This condition has serious consequences.

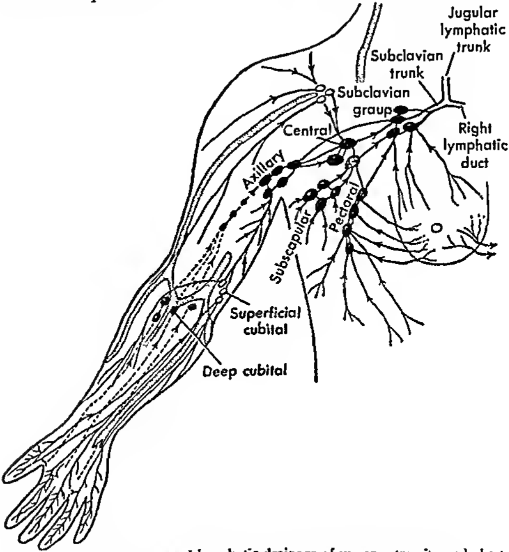



Fig. 16 Lymph nodes and lymphatic drainage of upper extremity and chest wall. (From Radasch, H. E · *A Manual of Anatomy.* Courtesy of W. B. Saunders Company, Philadelphia )

**Lymph.** The exchange of oxygen and waste products between the blood and the tissues does not take place directly but takes place through the lymph, or tissue-fluid which bathes the tissues. This is a fluid which has much the same composition as blood serum and is, in fact, formed from blood plasma by filtration through the walls of the capillaries.

The lymphatics. Since lymph is constantly being formed, there must be a mechanism by which it is removed from the tissues to prevent too great an accumulation. It is collected in small vessels called lymphatics, much like the blood capillaries in structure. These eventually become larger, just as the veins do, until they unite to form the two main lymph channels, the *thoracic duct* and the *right lymphatic duct*. These empty into the large veins of the neck shortly before they unite to form the superior vena cava.

The lymph nodes. Along the course of the lymphatics are accumulations of lymphoid tissue known as lymph nodes. There are many of these in the groin, the axilla, and the neck. These nodes act as filters for the lymph and may become swollen in various infections. For instance, in infection of the pharynx, the lymph draining this area may carry some of the infecting organisms to the lymph nodes of the neck, thus causing the nodes to swell. This is what takes place in children who are said to have "swollen glands."

The spleen. The spleen, an organ about 5 inches long, 3 inches broad, and 1½ inches thick and weighing normally from 5 to 7 ounces, lies in the left side of the abdomen under the ribs, between the stomach and the diaphragm. Its functions are not completely understood, but it is known to act as a filter for the blood stream, freeing it from worn-out red corpuscles but retaining the hemoglobin in the body. It also filters out abnormal cells, as in leukemia, for example, and certain organisms such as those causing malaria. In these latter conditions and in certain others, the spleen may become enormously enlarged. It is sometimes ruptured by direct violence, with severe hemorrhage into the abdominal cavity as a result.

The spleen is not necessary to life and may be removed without harm to the patient.

## *SUMMARY*

The circulatory system consists of blood, lymph, and the channels through which they flow. The blood contains red and white corpuscles, platelets, and blood plasma.

When there is an injury to a blood vessel, the flow of blood through the opening must be stopped by the blood's clotting; if however, the hole is too large or other necessary conditions for clot

ting are not present, a hemorrhage may occur in which a considerable amount of blood is lost When the blood clots, a liquid is separated from the clot This liquid is blood serum

The heart is a muscular organ which acts as an engine in pumping the blood through the blood vessels as it carries oxygen and foodstuffs to the body and returns with its burden of carbon dioxide and wastes to be excreted By the contraction of the ventricles of the heart, blood is pumped from the atria through the valves of the heart into the large arteries The valves allow the blood to flow toward the arteries but prevent its backflow Arteries are tubes with walls which stretch to take in a large amount of blood with each beat of the heart They divide into branches of decreasing size until, in the capillaries, the exchange of substances between the blood and tissues takes place The blood flows from each capillary into the corresponding venules, which, in turn, lead into larger and larger veins until the heart is reached

The rate of blood flow is the length of time required by a drop of blood to complete its journey through the arteries and veins

The exchange of oxygen and waste products is effected when a liquid called lymph passes through the capillary walls and surrounds the cells The lymph is accumulated in the lymphatics, which empty into two main lymphatic ducts They, in turn, empty into large veins in the neck which unite in the superior vena cava

The lymph nodes are accumulations of lymph tissue which act as filters They may become infected

The spleen acts as a filter for the blood stream, freeing it from worn out red corpuscles and abnormal cells

## Questions

1 List two functions of the blood
2 What are other names for red blood corpuscles, white blood corpuscles, and platelets?
3 What is the name of the fluid left after the blood has clotted?
4 Discuss the blood clotting process
5 Name three substances which aid in the clotting process
6 The patient's diagnosis is endocarditis Which layer of the heart is involved?
7 Name the layer which forms the outer covering of the heart

8. What large vessel carries blood away from the heart?
9. What vessels bring blood to the heart?
10. Locate the heart.
11. What is the function of the heart?
12. List and locate the valves of the heart.
13. From what chamber of the heart does blood go to the lungs?
14. What vessels of the circulatory system have the thicker walls? Explain.
15. Discuss the work of the capillaries.
16. What is the name of the tissue fluid that surrounds cells?
17. What can you do to aid the return of venous blood to the heart?
18. Of what use are the valves within this system?

# 10

# THE DIGESTIVE SYSTEM

Nourishment is needed by all the cells of the body to keep them alive and enable them to perform their necessary functions. Different kinds of cells need different kinds of nourishment. We therefore need some apparatus to convert the food we eat into suitable materials for use by the different cells. Such an apparatus is our digestive system. The digestive system can best be understood by thinking of it as a long tube with an opening at each end, beginning with the mouth, where the food is taken in, and ending at the anus, where the waste products are expelled. Opening into this tube in various places are smaller tubes or ducts coming from glands which also form a part of the system. By the process of digestion, the different kinds of food are broken down into simpler compounds so that they can be taken up by the blood stream and conveyed to different parts of the body for nourishment of the cells.

Metabolism. The changes that occur in digested foodstuffs from the time of their absorption until their elimination from the body are described as metabolism. This includes all the chemical activities that take place within the cells.

Glands. In order to understand digestion, we must know something about glands. A gland is a group of cells which make and then give forth certain materials known in the digestive system as "juices." This process is called "secreting," and the "juices" are often

termed secretions. Some of these glands are made up of bunches of cells which give out their products into tubes or ducts opening into the digestive canal. The glands that secrete saliva are glands of this type. Other glands consist merely of gland cells forming part of the lining of the digestive tube. These send their products directly into the main tube without going through any ducts. The glands that secrete the gastric juice in the stomach are of this type.

## *THE DIGESTIVE TUBE, OR ALIMENTARY CANAL*

The digestive tube, also called the alimentary canal, has two main functions to perform:

1. To provide a place where the food can be acted upon by the digestive juices and be absorbed.
2. To move the food along in the tube. This allows the food to be acted upon by different juices in different parts of the canal and finally brings about the elimination of the waste products of digestion.

### GENERAL STRUCTURE OF THE DIGESTIVE TUBE

In order to accomplish its various functions, the tube is composed of three layers:

1. The innermost layer, called the mucous layer, contains small glands, numerous blood vessels, and lymph vessels.
2. The middle layer, called the muscular layer, is composed of muscle fibers, some running longitudinally and some encircling the tube. The motion in the tube which pushes the food along takes place by means of alternate contraction and relaxation of these muscles and is known as *peristalsis.*
3. The outer layer is fibrous. It is covered throughout most of the length of the intestines by a thin layer of tissue known as peritoneum and also called the serous layer.

The peritoneum. This tissue, covering most of the abdominal organs, also lines the inside of the abdominal cavity. It secretes a small amount of fluid, which keeps the outer surfaces of the intestines and other organs lubricated where they come in contact with each other and with the inner surface of the body wall. The presence of this fluid gives the peritoneum its name of *serous* layer.

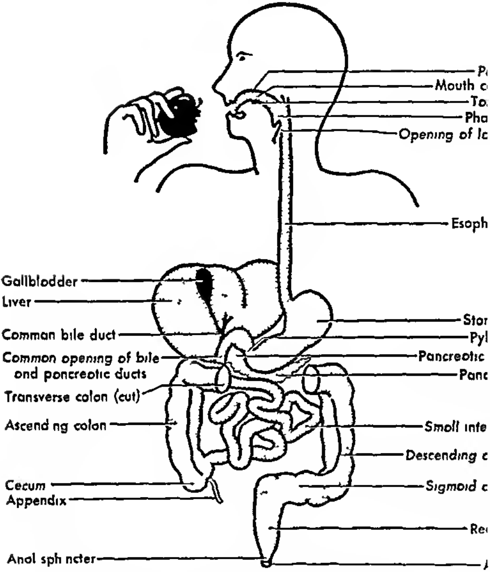



*Fig 17 The digestive system of man* (Hegner Robert W and St Karl A *College Zoology* 6th ed The Macmillan Company New York 19

The mouth Suppose we follow the progress of the food wh we eat at any one time and see what becomes of it It is first tal into the mouth, where it is ground up by the teeth, mixed w saliva, and pushed by the tongue back to the pharynx so that food may be swallowed

The teeth are very important in securing proper digestion, f unless the food is ground up into small pieces, the juices cannot on it completely and it may pass through the tube partially digest

The shapes of the teeth are admirably adapted to their function, for the flat surfaces of the front incisors enable them to bite off pieces of food and the back molar teeth are shaped for grinding. There are two sets of teeth: one, the temporary or "first teeth," 20 in number; and the "permanent teeth," of which there are 32.

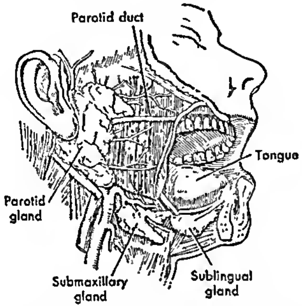



FIG. 18. The salivary glands and their ducts (Kimber, Diana C; Gray, Carolyn E.; Stackpole, Caroline E.; and Leavell, Lutie C: *Textbook of Anatomy and Physiology*, 13th ed. The Macmillan Company, New York, 1955.)

The tongue is largely composed of muscles which enable us to move it around in all directions. On the surface of the tongue are what are known as taste buds, different buds for different tastes. For instance, those situated at the tip of the tongue are stimulated by a sweet taste, those at the back by a bitter taste. A pleasant taste causes an increased flow of gastric juice, which aids digestion of the food. An unpleasant taste depresses gastric secretion with loss of desire to eat and may even cause nausea. Hence the importance of careful cooking for the invalid.

The saliva comes from the salivary glands, of which there are three on each side. The saliva dissolves part of the food, lubricates it so that it can be swallowed easily, and begins digestion of the starches.

The esophagus. After the food has been chewed, mixed with saliva, and pushed back to the pharynx by the tongue, it is started on its way down the esophagus by the act of swallowing, which is accomplished by the contraction of muscles in the pharynx The esophagus, a tube about 10 inches in length, lies just in front of the backbone in the thorax, goes through an opening in the diaphragm, and opens into the upper end of the stomach No digestion takes place in the esophagus It serves merely as a passageway for the food between the mouth and stomach

The stomach is a dilated pouchlike portion of the digestive tube It serves as a place where food may be acted upon by the gastric juices before continuing its journey It is situated in the upper left portion of the abdominal cavity The upper part of the stomach is called the *cardiac portion,* and the lower part is called the *pyloric region* The stomach is very elastic and varies in shape according to the amount of food it contains The wall of the stomach has a heavier muscular layer than that in the intestine, this muscular layer enables it to contract powerfully and churn the food about Such action helps to mix the food thoroughly with the gastric juice as well as to push it along

Gastric juice is a clear liquid secreted into the stomach, without the necessity of ducts, directly from the glands in the lining of the stomach It is composed of two main constituents one, the juice itself which acts on protein—meat, fish, cheese, and eggs—and the other, hydrochloric acid, without which the protein cannot be digested (Protein and other food elements are discussed at length in Chap 17, "Food The Foundation of Good Health")

The pyloric sphincter. As the food is digested, it is pushed down to the lower part of the stomach and is allowed to escape into the small intestine in small amounts This is accomplished by means of a band of muscle which encircles the opening from the stomach into the next portion of the tube This muscular band is called the pyloric sphincter When this circular muscle contracts, it closes the orifice When it relaxes, the passage opens and allows food to leave the stomach and enter the small intestine

The small intestine is a very long tube (over 20 feet in length) which, in order to fit into the abdomen, has to be coiled many times For purposes of description, it is divided into three portions the *duodenum,* which joins the stomach, the *jejunum,* a short portion

just below the duodenum; and the *ileum,* a much longer section which empties into the large intestine. The great length of the small intestine gives opportunity for efficient action of the digestive juices, for this process is practically completed here. Also, it increases the surface in contact with the food, thus favoring absorption of the products of digestion, such absorption occurring, in part, in the small intestine. The mucous layer lining this portion of the tube also increases the absorption surface by means of tiny fingerlike projections called *villi.* These villi are richly supplied with blood vessels and lymph capillaries, the significance of which we shall see later.

The duodenum. While the food is in the duodenum, it comes in contact with bile and pancreatic juice. Here the ducts from the liver and pancreas open into the digestive tube. The pancreatic juice acts on all three elements of our food: protein, carbohydrates (sugars and starches), and fat. The bile from the liver contains several materials. Some help the pancreatic juice to digest fat. Others, waste products from the liver, leave the body by way of the intestine.

The jejunum and ileum. From the duodenum the food enters the jejunum and from there passes on through the ileum. These contain numerous small glands which secrete substances aiding digestion.

The colon, or large intestine, gets its name because, although it is not so long as the small bowel, its circumference is greater. It is described as having four portions: (1) the *cecum* (to which the vermiform appendix is attached), (2) the *colon,* (3) the *rectum,* and (4) the *anal canal.* The cecum is a blind pouch into which the lower end of the small intestine, the ileum, enters at an angle. The colon, although continuous, is described as having three portions, named for the directions which the colon takes as it bends around the abdominal cavity: (1) up—ascending, (2) across—transverse, and (3) down—descending. The turns are called *flexures.* The first turn occurs near the liver and is called the *hepatic* flexure; the second turn, near the spleen, is called the *splenic* flexure; and the third is called the *sigmoid* flexure because it is shaped like the letter S, which in Greek is called *sigma.*

The large intestine contains no villi. Its most important function is to absorb water. The digested food reaches it in liquid condition, and, while passing along the colon, the fluid is largely absorbed but

the waste matter is left behind. By the time it has reached the sigmoid, the waste matter has become solid and is known as the *feces*. Besides the indigestible portion of the food, feces contain many bacteria which exist in the digestive tract. If too much water is absorbed from the contents of the colon, the feces become so hard that their expulsion is difficult, while, if not enough is absorbed, they remain liquid or semisolid when passed. The former condition is known as constipation, the latter, as diarrhea.

The rectum is about five or six inches long and is situated in the pelvis behind the bladder. Waste products are stored in the colon until their expulsion through the anus by the act of defecation. The anal opening is usually kept shut by means of circular muscles called *sphincters*, which have the same sort of action as the pyloric sphincter. Normally, the rectum should be empty until just before defecation. At certain times, depending largely on the habit of the individual, peristaltic motions of the colon push the feces into the rectum, and this causes the desire to defecate. It is important to act on this desire and cultivate regular habits of bowel elimination in order to prevent clogging of the rectum by a hard constipated stool which makes defecation difficult and necessitates straining.

## ABSORPTION OF FOOD

Protein and carbohydrate. But what has been happening to the portion of food that has been digested and is ready for use? A part is absorbed through the cells covering the villi lining the small intestine and is taken into the capillaries. The blood in these capillaries is finally collected in a large blood vessel known as the portal vein and conveyed to the liver. Here some substances are stored, some are still further changed, and the rest pass through into the general circulation for distribution throughout the body.

Fat. The products of fat digestion, however, are distributed by a slightly different route. Instead of entering the blood capillaries in the intestinal villi, they enter a different set of tiny capillaries which contain not blood but lymph. This lymph is collected into a larger lymph vessel known as the *thoracic duct*, which conveys it to one of the large veins in the neck and then empties it into the blood stream.

THE PANCREAS

No description of the digestive system is complete without a little more detail concerning the pancreas and the liver. The pancreas is a large gland situated in the upper part of the abdomen below and behind the stomach. It has two different kinds of cells. One type secretes digestive juices into ducts which finally come together and empty into the duodenum. The other cells are situated in little groups richly supplied with capillaries. These cells secrete a substance known as *insulin*, which is necessary for normal sugar metabolism. A lack of sufficient insulin causes the disease known as diabetes mellitus.

THE LIVER

The liver is one of the largest organs in the body. It weighs about 3 to 3½ pounds and is situated high in the abdominal cavity under the diaphragm. It stores sugar and regulates the amount sent into the blood so that the amount of sugar in the blood does not undergo violent changes. Concerned in the metabolism of protein, it breaks down the protein further than the digestive processes do. It also secretes bile, which is essential in the digestion of fats. This bile is collected in small ducts which finally come together to form a large duct called the *hepatic duct.*

THE GALLBLADDER

Branching off from the hepatic duct is another duct called the *cystic duct.* This leads to an elastic sac called the gallbladder, where bile is stored and concentrated. Just below the gallbladder, the hepatic and cystic ducts join to form a single tube which opens into the small intestine. This tube, called the common bile duct, carries the concentrated bile to the intestine as this is needed for digestive purposes.

## *SUMMARY*

Since being nourished is an essential function of the different cells of the body, an apparatus known as the digestive system is necessary. This system extends from the mouth to the anus.

In the process of digestion, foods are broken down into simpler compounds which can be taken up by the blood stream and conveyed to different parts of the body The changes which take place in digested foodstuffs, from absorption to elimination, are called metabolism The digestive juices are secreted by glands

The two main functions of the digestive tube are (1) to provide a place where food may be acted upon and (2) to move food along so that it may be acted upon by different juices in different parts of the canal until finally the waste may be eliminated

The digestive tube is composed of three layers (1) the inner most (mucous), (2) the middle (muscular), and (3) the outer (fibrous) The peritoneum covers most of the abdominal organs and lines the abdominal cavity

The food passes through the successive parts of the alimentary canal mouth, pharynx, esophagus, stomach, small intestine, and large intestine The waste is finally eliminated from the rectum through the anus

In the mouth, food is mixed with saliva and is ground up so that it may be swallowed In the stomach, proteins are partly digested by the gastric juices Fat is digested by the bile secreted by the liver after the bile has flowed into the small intestine All foods are changed by the pancreatic juice Part of the food is absorbed in the small intestine The products of fat digestion enter a set of capillaries which contain lymph, eventually conveyed to the thoracic duct

The pancreas, liver, and gallbladder are connected to the digestive tubes by ducts The pancreas secretes insulin, a substance necessary for normal sugar metabolism by the body The liver stores sugar, regulates the amount of sugar in the blood, breaks down protein, and secretes bile, which is essential to the digestion of fat The gallbladder is a sac in which bile is stored and concentrated until it is carried to the small intestine, where it is needed for digestive purposes

Questions

1 What is the function of the alimentary canal?
2 Can you estimate how long the tube is in this canal?
3 Look in the medical dictionary for the name and location of the three pairs of salivary glands, if you do not already know them

4. Discuss the structure of the digestive tube.
5. What is the first activity of the digestive process?
6. Discuss the effect of taste and smell on the digestive juice.
7. Locate the esophagus and explain its function.
8. In what portion of the tube does the digestion of each of the following begin: carbohydrates, proteins, fats?
9. Discuss fully the small intestine.
10. List the parts of the large intestine.
11. Where does the absorption of (a) food and (b) water take place?
12. What increases the absorption of food? At what point does this happen?
13. Discuss the pancreas as a vital secretory gland.
14. Of what importance is the lymphatic system in the absorption process?
15. Locate the gallbladder. How important is it in the digestive process?
16. What have you learned about the liver and its functions?
17. Define the words *digestion* and *metabolism*. What is their relation to each other, if any?
18. Draw a diagram of the digestive tube from mouth to anus. Label all parts.
19. Consult the Glossary for the meaning of the following: absorb, duodenum, feces, ingestion, viscera.

# 11

# THE RESPIRATORY SYSTEM

The tissues must have oxygen to carry on the chemical activities that take place in their cells and to get rid of the carbon dioxide formed during those activities Oxygen, therefore, must be continually supplied to all the cells of the body, and the carbon dioxide must be carried away This exchange of gases is called respiration, or breathing

How the blood carries oxygen to, and removes carbon dioxide from, the tissues has been described in Chapter 9, "The Circulatory System" What concerns us here is the mechanism which brings oxygen to the blood and eliminates carbon dioxide from the blood The oxygen is derived from the air we inhale The carbon dioxide is carried away in the air we exhale The organs concerned in this interchange of gases are grouped together in the respiratory system

**The nose.** Air enters our bodies through the nose and, under certain conditions, through our mouths The nose, however, is so constructed that the air, in passing through it, is cleansed, warmed, and moistened before it reaches the more sensitive portion of the respiratory tract For this purpose, the cavity of the nose is divided in the middle by a bony and cartilaginous wall (the *septum*) and is thrown into several folds and ridges (the *turbinals*), which increase the surface of the cavity walls The entire cavity is lined with mucous membrane and has a generous blood supply Air entering

the nostrils first passes the fine hairs situated just within; these catch and hold the coarse impurities. It then passes over the mucous membrane covering the nasal cavities. In so doing, it is warmed and is moistened somewhat by the nasal secretion, and more impurities are removed by the rather sticky mucus which is secreted in the nasal membrane.

Palate. Just below the nose is a partition separating the nose from the mouth. This partition is made partly of bone, known as the hard palate, and partly of soft tissue, known as the soft palate. Together, they form the roof of the mouth.

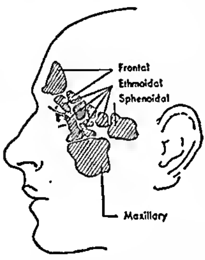



FIG. 19 Sinuses projected to the surface of the face. All except the maxillary sinus are near the central line of skull when viewed from the front. (Kimber, Diana C ; Gray, Carolyn E., Stackpole, Caroline E.; and Leavell, Lutie C.: *Textbook of Anatomy and Physiology*, 13th ed The Macmillan Company, New York, 1955 )

Pharynx. This partition extends back to what is generally called the throat. The nasal cavity opens into the throat or pharynx above the level of the roof of the mouth, but the openings cannot be seen when looking into the throat. This upper part of the pharynx is called the *nasopharynx*; where the nasal cavities open into it, little masses of special tissue, called *lymphoid tissue*, are found. If they become enlarged because of acute or chronic inflammation, they may so interfere with the passage of air from the nose into the pharynx that the individual has to breathe through the mouth. Such a person is said to have "adenoids." Below the nasopharynx is the *oropharynx*, in which the tonsils are situated. It is the oropharynx we see when we look at a person's throat.

The paranasal sinuses. Certain bones of the skull have cavities or sinuses in them which connect with the nose and are lined with mucous membrane similar to that which lines the nose. The cavities in the cheekbones are called the *antra*; those in the frontal and ethmoid bones are called the *frontal* and *ethmoid sinuses*, respec-

tively. These cavities serve to make the bones lighter and to give the voice more resonance. Because these cavities open into the nose and are lined with a membrane similar to nasal membrane, they are liable to infection whenever the nose becomes infected.

The larynx. When the air has passed through the nose and pharynx on its way to the lungs, it enters the larynx, which is situated just in front of the beginning of the esophagus. This structure can best be understood by comparing it to a box with a lid at the top. Its sides are held rigid by cartilages, the largest of which can be felt on the front of the neck as the Adam's apple. The lid, or *epiglottis*, is also cartilaginous. This lid closes down and covers the opening to the larynx when we eat or drink, so that food cannot get down into the lungs. We cannot, therefore, breathe and swallow at the same time. At the bottom of the box is the opening into the trachea or windpipe. At this opening are situated the vocal cords, one at each side. These consist of folds of fibrous tissue attached to cartilages at each end. The air passing the vocal cords in forceful expiration causes them to vibrate, and it is this vibration that makes the voice.

The trachea, through which the inspired air next passes, is a tube 4½ inches long and 1 inch in diameter and is situated in front of the esophagus. Its walls are held stiff by means of cartilaginous rings, which, however, do not encircle the tube, although they keep it open. At the back, where the trachea is in contact with the esophagus, they are completed by muscle tissue. A good idea of their size may be obtained by putting a finger on the front of the neck, just below the Adam's apple. The trachea is lined with mucous membrane, the surface of which catches many of the impurities that pass through the nose.

The bronchi. The trachea branches into what are known as the two main bronchi, one leading to the right lung and the other to the left lung. These main bronchi then branch into smaller and smaller tubes. The trachea and bronchi are often spoken of as the "bronchial tree," a very good description. The larger bronchi are constructed much like the trachea, but as they get smaller they lose their cartilages and their walls become thinner and thinner. The smallest bronchi (or *bronchioles*) finally end in *alveoli*. These are tiny sacs with very thin walls so that the air in them comes in close contact with the blood which circulates through the lungs. This

process facilitates the absorption of oxygen and excretion of carbon dioxide by the blood.

The lungs are situated one on each side of the thoracic cavity. They are covered with a smooth membrane called the *pleura,* which also covers the inner surface of the thoracic cavity and prevents friction during the movements of the lungs in respiration.

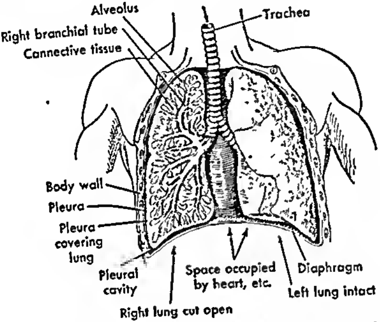



FIG. 20. Diagram of a section through the chest region in man, showing the lungs and thoracic cavity. (Woodruff, Lorande L., and Baitsell, George A.: *Foundations of Biology,* 7th ed. The Macmillan Company, New York, 1951.)

Control of respiration. We have seen how the diaphragm and intercostal muscles act to increase the size of the thoracic cavity, thus pulling the air into the lungs. These muscles work in response to impulses sent from the brain to the nerves that control their action. The respiratory center is in the brain. This controls the rate at which impulses are sent to the muscles causing them to contract. An increase in the carbon dioxide content of the blood stimulates the center to send impulses at a greater speed. Such an increase in carbon dioxide takes place during muscular exercise, fever, and most toxic conditions. This explains why we breathe faster after exercise and during fevers and many diseases.

## *SUMMARY*

Respiration is the exchange of two gases (1) oxygen, which is essential to the tissues, and (2) carbon dioxide, which is waste formed during the chemical activities in the tissues

The circulatory system carries these gases to and from the respiratory system, comprising the nose, the palate, the pharynx, the paranasal sinuses, the larynx, the trachea, the bronchi, and the lungs

When the air is in the smallest bronchioles, it comes in close contact with the smallest blood vessels, thus the exchange of gases is effected at this time, the oxygen being diffused from the alveoli and the carbon dioxide being diffused to them from the capillaries

Respiration is controlled by the contraction and relaxation of the diaphragm and the intercostal muscles The respiratory center lies in the brain It controls the rate at which impulses to contract are sent to the muscles As the amount of carbon dioxide in the respiratory system increases, the impulses to breathe come more frequently

### Questions

1 Name the organs of the respiratory system
2 What is the function of this system?
3 What happens to the air as it is inhaled into the nose? Explain
4 Explain how the voice is produced
5 What is the normal range in the rate of respiration?
6 What are the common names for the pharynx, the larynx, and the trachea?
7 Name and locate three pairs of sinuses
8 Name the cartilage which forms a lid for the larynx
9 What is the name of the membrane which covers the lungs and lines the thoracic cavity?
10 What is the principal muscle responsible for enlarging the thoracic cavity?
11 At what point in the bronchial tree does the exchange of gases take place?
12 Draw a diagram of the bronchial tree, label the parts
13 Locate on your own body the Adam's apple Why is it so called?
14 The respiratory organs are lined with what type of tissue?
15 Locate the trachea How large is it?
16 Consult the Glossary for the meaning of the following mucus, nares, oral, phlegm, pleura-

# 12

# THE URINARY TRACT

The process of eliminating wastes from the body is carried on by the skin, lungs, alimentary canal, and urinary tract. The wastes excreted from the skin are in the form of perspiration. The lungs excrete water and carbon dioxide. The alimentary canal excretes water and solid matter derived from undigested food. The urinary tract excretes urine. These organs and systems considered together form the excretory system. All but the urinary tract have been studied in previous chapters.

The urinary tract consists of two kidneys (right and left), a bladder, two ureters, one running from each kidney to the bladder, and a urethra through which urine passes from the bladder to the outside of the body. The function of the urinary tract is to manufacture and to excrete urine, by which water, waste substances, and body chemicals, such as sodium and chloride, are eliminated from the body.

The kidneys, each the size of a small flat cucumber, are situated in back of the abdominal cavity, one on each side of the spinal column halfway under the lowest ribs. Unless enlarged they usually cannot be felt on physical examination. Essentially, the kidneys are complicated human filters which have the power of selecting certain substances for removal from the blood as it flows through them and excreting these substances as urine. The blood is brought to the

kidneys by the renal arteries, which are branches of the aorta, and the blood leaves the kidneys through the renal veins.

In certain conditions and diseases of the kidneys, they are not able to filter out the nitrogenous waste products from the blood, and therefore these waste substances "back up" in the blood and become abnormally concentrated and cause uremic poisoning (*uremia*),

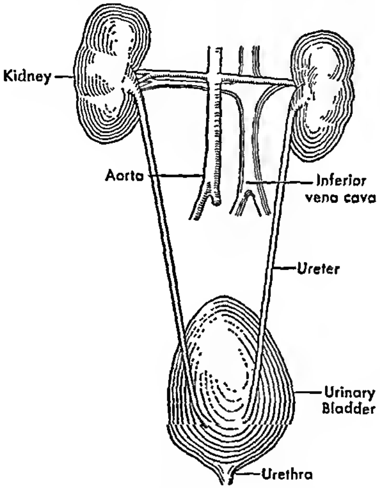



FIG 21. The urinary system, viewed from behind

which may be fatal. During fever, water is consumed more rapidly than normal by the body cells and is lost via perspiration. Extra fluids should be given to aid the kidneys in filtering waste products out of the blood. The same condition occurs naturally in hot weather when perspiration is increased; the urine will therefore be scanty and concentrated unless more than the usual amount of fluid is taken.

The ureters. Each kidney has a ureter, a thin-walled, hollow muscular tube 10 to 12 inches long and half the size of a pencil. Through this tube, the urine produced in the kidney is "piped" or conducted to the bladder.

The bladder. The bladder, situated deep in the pelvis, is a hollow, round organ whose wall is composed of muscle fibers. It acts as a storage reservoir for the urine and can normally hold two-thirds of a pint before the desire to urinate is strong. When it contracts in the act of urination, the urine is expelled, and the empty bladder collapses, something like a punctured balloon. The muscle walls of the empty bladder are one-eighth of an inch thick, but of course they become thinner as the bladder is distended with urine.

The urethra. The urethra is a tube or canal which runs from the bottom of the bladder to the outside of the body and through which the urine is expelled from the bladder during the act of urination. The caliber, or diameter, of the urethral canal is the size of a pencil.

The female urethra is slightly more than 1½ inches long, and its outside opening is inside the labia, just above the vaginal opening.

The male urethra is from 7 to 8 inches long. On leaving the bladder, it first passes through the prostate gland, a horse-chestnut-sized organ, which is situated all around the outlet of the bladder. Then it curves forward through the perineum and goes through the length of the penis to emerge at its tip.

A circular sphincter muscle which surrounds and compresses the urethra just below the bladder, in both males and females, controls the flow of urine. This sphincter muscle works in coordination with the bladder in the act of urination in such a way that the bladder contracts while the sphincter relaxes and opens, allowing the urine to flow out through the urethra. When urination is not going on, the situation is reversed: *the bladder relaxes while the sphincter is held contracted and closed, preventing urine from passing through the urethra.*

## *SUMMARY*

The urinary tract consists of two kidneys, a bladder, two ureters, and a urethra. The function of the urinary tract is to secrete and eliminate urine.

The kidneys are placed in the back of the abdominal cavity, one on each side of the spinal column Essentially, they are filters which remove excess water and wastes from the blood as it flows through them

Each kidney is connected to the bladder by a thin muscular tube, a ureter, through which the urine is passed to the bladder

The bladder situated in the pelvis, is a round, hollow organ which is a reservoir for the urine The urine is discharged from the bladder to the outside of the body through another tube, the urethra

The flow of urine is controlled by a circular sphincter muscle which compresses the urethra just below the bladder The urethra in the male is longer than in the female, it is encircled by the prostate gland in the male

## Questions

1 List the excretory organs of the body
2 What organs comprise the urinary system or tract?
3 Locate on your own body the kidneys What shape are they?
4 What can you do to make the work of the kidneys easier?
5 What kind of membrane lines the urinary tract?
6 How much urine can the bladder hold comfortably?
7 Locate the bladder (a) when empty, (b) when full
8 How long is the female urethra? How long is the male urethra?
9 What is the function of the ureters?
10 Name two factors which influence the output of urine
11 What is the function of the bladder?
12 What does the following statement mean? 'The kidneys excrete nitrogenous wastes"
13 Consult the Glossary for the meaning of the following distention, diuretic, liter, litho , micturition renal, retention, void

# 13

# THE REPRODUCTIVE SYSTEM

The function of the reproductive systems of the male and female is to bring new life into the world. This new life comes from the union of the male sex cell, or sperm, and the female sex cell, or ovum. This union is called fertilization of the ovum. The female reproductive system is therefore constructed so that this union can take place and the fertilized ovum can be housed, protected, and nourished until ready to be born as a new individual.

## *THE FEMALE REPRODUCTIVE SYSTEM*

In the female the principal organs comprising the reproductive system are the vagina, the uterus, the Fallopian tubes, and the female sex glands, or gonads, called the ovaries. These are situated within the pelvic cavity, which is formed, as will be recalled, by the framework of pelvic bones covered by ligaments and muscles. The breasts are also classed as reproductive organs, although they have no part in the development of the fetus, or unborn child.

**The vagina, labia, and vulva.** The vagina, an elastic tube about 3 inches in length, is situated just behind the urethra. At its upper end the cervix, or lower part of the uterus, projects into it, and at its lower end it opens to the outside just below the urethral opening. The urethral and vaginal openings are protected by two folds known

as the labia, this region being called the vulva. In the act of copulation, the sperm is ejected from the male organ into the vagina so that the sperm may be deposited on the cervix and enter the uterus through the cervical canal The vagina also serves as an outlet for the secretions of the uterus, and the baby passes through it at birth Because of the latter function, its walls must be capable of great stretching

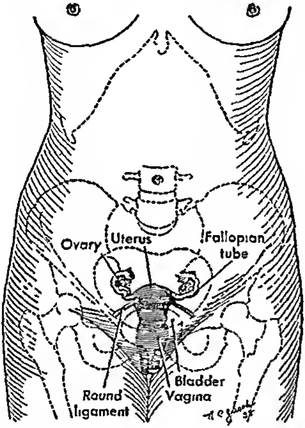



FIG 22 The human female reproductive system Dotted lines indicate the position of the pelvis and other bones (Cornor, George W, *Attaining Womanhood* Paul B Hoeber, Inc., New York, 1952)

Uterus. In its normal nonpregnant condition, the uterus is a hollow, pear-shaped organ about 3 inches long and is situated in the pelvis behind the bladder and in front of the rectum It is slung in a hammock composed of ligaments which support it and keep it in place It is described in three portions (1) the broad upper portion, or *fundus*; (2) the middle portion, called the *body*, and (3) the narrow necklike portion, or *cervix*, which projects into the vagina

The cavity of the uterus in the cervical portion is narrow and is called the *cervical canal*; it ends in an opening called the *external os*. The walls of the uterus are composed of smooth muscle, which has the capacity of stretching and enlarging to a great extent. The cavity of the uterus is lined by a special kind of mucous membrane which has many blood vessels and lymphatics. At the upper corners of the uterus are openings into the Fallopian tubes. The function of the uterus is to protect and nourish the developing fetus and to expel it at birth.

Menstruation. This process, occurring about every 28 days, consists of a discharge of blood, mucus, and worn-out cells from the lining of the uterus. Its purpose is to keep the lining of the uterus always fresh and ready to receive and embed the fertilized ovum. Menstruation begins with puberty at about the age of twelve and ceases at the menopause, or change of life, usually somewhere in the late forties. It ceases temporarily during pregnancy.

Fallopian tubes. These are two hollow tubes situated along the top of the two broad ligaments which support the uterus. At one end they are joined to the uterus, and at the other end they open into the peritoneal cavity. Like the other tubes of the body, they are lined with mucous membrane and have muscular and fibrous coats. The function of the tubes is to convey the ova from the peritoneal cavity to the uterus.

Ovaries. The ovaries are solid organs about the size of an almond. They are situated, one on each side, just below the Fallopian tubes and are attached to the broad ligaments. They are composed of fibrous tissue and contain ova in various stages of development. They also contain cells which furnish certain secretions to the body, one of which seems to control menstruation.

Ovulation and fertilization. When the ovum is fully developed, it is cast off from the ovary into the peritoneal cavity and picked up by the end of one of the tubes. In the average woman, this process occurs every four weeks, about midway between menstrual periods, and is known as ovulation. The ovum then enters the Fallopian tube and is propelled along the tubal canal toward the uterus. While it is in the Fallopian tube, one of two things happens. It may become fertilized by the sperm of the male, in which case pregnancy results, or, if it is not fertilized, it degenerates. The process of fertilization occurs as follows: the sperm, in order to meet the ovum, is deposited

in the vagina and on the cervix It then swims upward through the cervical canal and uterine cavity and enters a Fallopian tube If an ovum is in the tube when the sperm reaches it, the two join and the process of fertilization has occurred The fertilized ovum continues down the Fallopian tube to the uterus and fastens itself to the lining of the uterus, and pregnancy proceeds Its further development is described under pregnancy

The breasts, or mammary glands, are situated on the anterior chest wall Normally, they are composed largely of glands with ducts leading to the nipple During pregnancy the breasts enlarge, and the breast tissue increases in amount so that, by the time the baby is born, the glands normally should be able to secrete sufficient milk to nourish it

## *PREGNANCY*

By the term "pregnancy" is meant the condition of a woman who has within her body a fertilized ovum The duration of pregnancy is usually about 280 days from the onset of the last menstrual period in the average woman The actual time it takes for the development of the ovum is more likely to be 268 days It should be borne in mind that, during the time the fetus is in the uterus, the fetus is absolutely independent of the nervous system of the mother No fright or shock to the mother has the slightest effect on the body or mind of the developing child

### DEVELOPMENT OF THE EMBRYO

It must be remembered that the fertilized ovum is but one cell The first stage in its development is to divide into two cells These in turn divide again, and the various structures of the body are gradually differentiated The first few divisions take place in the tube, and by the time the ovum embeds itself in the wall of the uterus, it consists of several cells and is called the embryo, later in pregnancy being called the fetus Its further development takes place within the uterus

Formation of the placenta. Gradually there grow out from the embryo fingerlike projections called *chorionic villi,* which penetrate

into the wall of the uterus and form connections with the mother's blood vessels. Thus the mother's blood can provide food and oxygen for the embryo by their passage through the connecting walls of these blood vessels. It is these chorionic villi which form the placenta, or afterbirth.

Umbilical cord. As the embryo becomes still larger, it pushes out into the cavity of the uterus, at the same time remaining connected with the uterine wall and placenta by means of the umbilical cord. This cord is composed of a jelly-like substance and contains three large blood vessels, one of which conveys blood from the placenta to the embryo and carries food and oxygen from the mother to the embryo. The other two convey blood from the embryo to the placenta and take waste materials from the embryo to be excreted by the mother.

Amniotic sac and membranes. If the embryo inside the uterus were not further protected in some way, it would be jarred every time the mother walked or moved. It therefore floats in a sac of fluid called the amniotic sac, often known as the "bag of waters." This fluid acts as a shock absorber, and in addition provides an excellent constant environment in which the fetus develops. The wall of this sac is composed of a membrane of tissue called the *amnion,* and between this and the lining of the uterus is another membrane called the *chorion.* The chorion and amnion are spoken of together as the fetal membranes.

## CHANGES IN THE MOTHER DURING PREGNANCY

Enlargement of the uterus. As the embryo develops and increases in size, the uterus must also enlarge to keep pace with it. Its muscle fibers grow in length and breadth, and it gradually extends up out of the pelvis into the abdominal cavity, where it pushes aside the abdominal organs as it grows larger and larger.

Stretching the abdominal wall. As the uterus enlarges, the abdominal wall becomes stretched. This causes the appearance of fine lines called *striae,* which are due to splitting of the dermis. Striae appear chiefly over the lower abdomen and flanks.

Enlargement of the breasts. As already mentioned, the breasts enlarge because of the increase in gland tissue. This enlargement may cause the same kind of striae to appear as are seen in the

abdominal wall At about the third month of pregnancy, turbid fluid may sometimes be expressed from the breasts This is not milk Milk is secreted only after the birth of the baby

## SYMPTOMS AND SIGNS OF PREGNANCY

**Amenorrhea.** Usually the first thing noted that gives a clue to the possibility of pregnancy is the cessation of the menstrual flow This is called amenorrhea

**Frequency of urination.** During the first three months, the enlarging uterus is situated in the pelvis and may press on the bladder, thus causing a frequent desire to urinate Later on, as the uterus enlarges and rises out of the pelvis into the abdominal cavity, this pressure is relieved It reappears in the last few weeks, when the baby's head sinks into the pelvis preparatory to the onset of labor

**Morning sickness.** Many women have a feeling of nausea during the first three months of pregnancy, and may vomit This usually occurs in the mornings and may persist throughout pregnancy The exact cause for this is not known In some cases the nausea and vomiting are so severe and the mother becomes so weak that she should be removed to a hospital, where intravenous feedings can be accomplished if necessary

**Quickening.** At about the fifth month or slightly earlier, the mother begins to feel the movements of the baby This sensation is known as "quickening"

**The fetal heartbeat.** The first really sure sign of pregnancy is the hearing of the fetal heartbeat This is detected by the physician after the fourth month by means of a stethoscope placed on the abdomen of the mother

## PRENATAL CARE

The pregnant woman should get the proper food, plenty of rest, fresh air, and mild exercise as prescribed by the physician Attention should be paid to the bowels to secure regular elimination It is important that she pay regular visits to her physician in order that he may detect and, if possible, forestall any of the complications of pregnancy

### LABOR

No one knows exactly what initiates the process by which the child is born. After pregnancy is complete, the uterus starts to contract and push out its contents. This process up to, and including, the delivery of the child and placenta is called labor.

After the baby is born, the raw surface of the uterine cavity offers very favorable conditions for the growth of microorganisms which might lead to very severe infection. Therefore, precautions are taken to have everything that may come in contact with the patient absolutely sterile.

### CARE OF NEWBORN BABY

If a practical nurse happens to be with a woman in labor and the baby is born before the physician arrives, she should not interfere with the process in any way and should not touch the cord. It is, however, necessary to be sure that the baby is so placed that there is no strain on the cord and that the infant is covered with a warm blanket.

### THE PUERPERIUM

After delivery it usually requires about six weeks for the uterus and pelvic tissue to return to their normal size and condition. This period is spoken of as the puerperium. (The care of the mother during this time is discussed in Chap. 42, "Postnatal Care.")

## *THE MALE REPRODUCTIVE SYSTEM*

The male reproductive apparatus consists of the two testes, their epididymes (small bodies lying above the testes) and spermatic ducts leading to the two seminal vesicles, the prostate, and the penis.

The testes are two oval, glandular organs, known as the male gonads, which have two functions: to manufacture spermatozoa and to produce the male sex hormone. If one testis is lost, the other testis, if healthy, can carry on both these functions satisfactorily. In the

embryo the testes arise in the abdomen from the same type of tissue as do the ovaries in the female Normally, before birth they descend through the inguinal canal and pass out through the wall of the abdomen into the scrotum Abnormalities of this process of descent may result in undescended testis or hernia

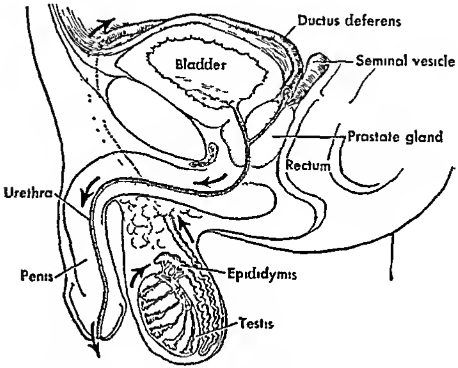



FIG 23 Male reproductive system Arrows indicate route of spermatozoa. (By permission from *Personal Health and Community Hygiene*, 2nd ed Copyright 1951 McGraw Hill Book Company, Inc )

The epididymis is attached to the side of each testis, somewhat like a cap on the side of a boy's head, and is the apparatus or pouch which collects the spermatozoa manufactured by the testes A spermatic duct, or *vas deferens*, runs from each epididymis up through the spermatic cord and the inguinal canal to the seminal vesicle on that side The function of the spermatic duct is to transport the sperm from the epididymis to the seminal vesicle

The seminal vesicles, one for each side, are small thick-walled tubular pouches which lie at the base of the urinary bladder and are connected with the prostate Their function is to store spermatozoa

and to ejaculate them via the ejaculatory duct into the prostatic urethra during sexual intercourse.

The prostate, a musculoglandular organ about the shape and size of a horse chestnut, is situated at the base of the bladder, the outlet of which it surrounds. The function of the prostate is to produce a secretion which is ejected at the moment of ejaculation in sexual intercourse and which is mixed with the spermatozoa coming from the seminal vesicles. This added secretion increases the activity of the spermatozoa.

Penis. As was mentioned in the chapter on the urinary system, the external opening or exit of the urethra in the male is at the tip of the penis; from there the urine leaves the body in the act of urination. Another important function of the penis, however, is in reproduction, where it functions to deposit the spermatozoa at the entrance to the womb of the female. The penis is composed of erectile tissue enclosed within a firm covering of fascia. Ordinarily, the penis is from 3 to 4 inches long and quite soft and flaccid. However, under conditions of sexual excitement, the spaces in its erectile tissue become engorged with blood, with the result that it becomes half again as long and as large, and quite stiff. This erect condition allows the tip of the penis to penetrate well inside the vagina in sexual intercourse, and the spermatozoa to be deposited at the mouth of the womb when they are ejaculated from the urethra at the climax of intercourse.

Foreskin, or prepuce. The skin covering the penis has a fold extending around the head (*glans*) of the penis, this fold being known as the foreskin, or *prepuce*. In babies this foreskin occasionally is adherent to the glans beneath. In order to correct this, the foreskin should be pulled back gently every day, a precaution which also allows for daily cleansing. If the adhesions are not eliminated by gentle pressure, the physician should correct the condition. Ordinarily the adhesions will disappear spontaneously as the boy develops. If the prepuce is too tight to be pulled back, circumcision (surgical removal of this fold of skin) is indicated to prevent future chronic inflammation underneath. In adults, chronic inflammation under the foreskin shows the need for circumcision, both for comfort and cleanliness and also for prevention of a precancerous chronic irritation.

## *SUMMARY*

The purpose of the male and female reproductive system is the generation of new human life by the union of the male sperm with the female ovum

The principal female organs are the vagina, uterus, the Fallopian tubes, and the ovaries, situated in the pelvic cavity within the framework of the pelvic bones, ligaments, and muscles The breasts are regarded as reproductive organs although they have no part in the development of the fetus

The ovum which is contained in the ovary is shed by the ovary into the peritoneal cavity, where it is picked up by one of the Fallopian tubes, along which it continues to the uterus if it is fertilized If it is not fertilized, it is cast off while in the Fallopian tube

The fertilized ovum fastens itself to the lining of the uterus, which, along with the abdominal wall, increases in size by stretching, to keep pace with the enlarging embryo

The breasts enlarge because of an increase in gland tissue Milk is secreted only after the birth of the baby

The expectant mother should have prenatal care After birth precautions are needed to prevent infection of the uterine cavity About six weeks is required for the uterus and pelvic tissues to return to normal size and condition

The male reproductive apparatus consists of the two testes, their epididymes and spermatic ducts leading to the two seminal vesicles, the prostate, and the penis The function of the penis is to deposit the spermatozoa at the entrance of the uterus

Questions

1 Name the organs of the reproductive systems, female and male
2 What are the functions of this system?
3 Locate the female reproductive organs How are they protected?
4 How are the urethral and vaginal openings protected? What is name of the region called?
5 With what kind of tissue is the uterus lined?

6. Of what does the menstrual flow consist? At what age range do the menses begin and cease?
7. What is the name of the narrow lower part of the uterus?
8. What is the function of the ovaries? Of the testes?
9. What is the name of the region between the vaginal orifice and the anal opening?
10. What is the function of the mammary glands?
11. In what organ of the reproductive system does fertilization take place?
12. What are the external organs of the male reproductive system?
13. Draw a diagram of a sperm cell.
14. What is the name of the male gonad? Of the female gonad?
15. Consult the Glossary for the meaning of the following: genitalia, hystero-, inguinal, labia, ligation, oöphoro-, orifice, trans-.

# 14

# THE ENDOCRINE SYSTEM

An endocrine secretion is one that instead of being poured out through a duct is absorbed by the blood, as the blood passes through the gland, and is carried to all parts of the body The glands with such secretions are called the glands of internal secretion, or the endocrine glands Some glands manufacture both an internal secretion (as described above) and an external secretion An external secretion is secreted by way of a duct into a cavity or upon a body surface The pancreas, for example, makes an external secretion which is carried to the small intestine by the pancreatic duct, and an internal secretion insulin, which is carried in the blood stream and controls the use of sugar in the body The sex glands also convey both an external secretion through a duct and an internal secretion (without using a duct) in the blood stream

## *NAMES OF GLANDS*

There are six important endocrine glands or gland groups in the body These are (1) the pituitary gland, or hypophysis, situated at the base of the skull, (2) the thyroid gland in the fore part of the neck, (3) the parathyroid glands embedded in the thyroid, (4) the pancreas in the abdomen, (5) the two adrenal glands above the kidneys, and (6) the sex glands, which *include* the ovaries and the

testicles. The ovaries are situated in the pelvis of the female. The testicles, or male sex glands, are in the scrotum. Other glands, such as the pineal gland, the thymus, the liver, and the kidneys may have internal secretions, although this possibility has not yet been proved.

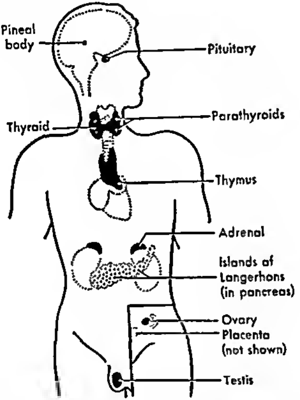



FIG. 24. A diagram to show the approximate location of some of the endocrine glands in man. Although the pineal body and thymus are included, they are not known definitely to be organs of internal secretion. (Hegner, Robert W., and Stiles, Karl A.: *College Zoology*, 6th ed. The Macmillan Company, New York, 1951.)

A great deal about the endocrine glands is not understood, but some of the more important facts have now become fairly well established. The internal secretion of each gland includes one or more chemical substances called hormones, which exert specific and characteristic stimulating effects on the growth and development of the body or control the rate at which certain important processes take place in the organism.

**The pituitary gland.** The pituitary gland consists of two parts, anterior and posterior, which have quite different functions The anterior pituitary produces at least six different hormones, some of which regulate the development and activity of the thyroid gland, the adrenal gland, and the sex glands (*gonads*) In this respect, the anterior pituitary may be thought of as the "conductor of the endocrine orchestra" A hormone produced by this gland controls the growth of the long bones, thereby determining the height to which an individual grows Another anterior pituitary hormone acts together with insulin (from the pancreas) to control the metabolism, or assimilation, of sugar while still another pituitary secretion is responsible for stimulating the breasts to begin lactation at the proper time after pregnancy

The posterior pituitary produces a hormone which controls the rate of urine formation by regulating the excretion of water through the kidneys

**The thyroid gland.** The hormone made by the thyroid gland controls the rate at which the vital processes of the body are carried on, and the rate at which the body uses oxygen Therefore it also affects the rate of body growth, the rate at which the heart beats, and the rate at which mental processes occur It may be thought of as a governor of the body's engine, if it is too active, the engine runs too fast, and if its function is depressed, the engine runs too slow

**The parathyroid glands** seem to have but one task, and one would seem enough for such small structures, for they are normally each not larger than a grain of rice These tiny glands control the use of calcium and phosphorus in the body At present no other function has been discovered

**Pancreas.** The endocrine function of the pancreas is to control the use of food elements, particularly carbohydrate, in the body It does this by means of a secretion called insulin Lack of insulin causes the disease called diabetes mellitus, while too much insulin causes a deficiency of sugar in the blood and tissues

**The adrenal glands** The adrenal glands, situated in the abdomen just above the kidneys, consist of two parts, one inside the other The inner part, the *medulla,* secretes two hormones (epinephrine, or adrenaline, and nor-epinephrine) which help regulate the circulation and the blood pressure In addition, epinephrine has the important function of stimulating the activity of the brain, heart,

and muscles at times of sudden stress, so that the body can meet the extra demand for energy during emergencies. The outer covering of the adrenal gland, called the *cortex,* secretes a large, and as yet unknown, number of hormones which have many important functions. These latter include the control of the excretion of minerals and water by the kidneys, the regulation of protein, fat, and carbohydrate metabolism, and the development of male and female sexual characteristics.

Gonads. The sex glands, or male and female gonads, have internal secretions which have much to do with the secondary sex characteristics. The secretion of the ovaries is essential to the normal feminine appearance, and the testicular secretion probably gives to the male his masculine characteristics, such as the growth of hair on the face and body and the characteristic body form. Their greatest influence must therefore be exerted during adolescence, when the male and female characteristics are being developed.

## *SUMMARY*

The endocrine system is composed of several glands, primarily of internal secretion, although some also manufacture external secretions. They are tremendously important and the subject of great interest to the medical profession. Scientists are still discovering new facts about them.

The hormones which they secrete have a definite effect on growth, the development of the body, and the rate at which certain processes take place in the body.

The names of the glands of internal secretion are: the pituitary gland, the thyroid gland, the parathyroid glands, the pancreas, the adrenal glands, and the gonad glands. Some other glands also may be found in the future to manufacture internal secretions.

### Questions

1. In what class of glands are the endocrine glands?
2. Name and locate the organs of this system.
3. Which endocrine gland is considered the "master" gland?
4. What is the name of an endocrine secretion?

5. What is the function of the endocrine system, as a whole?
6. What endocrine gland controls the use of carbohydrates in the body?
7. What endocrine gland may be called upon in a sudden emergency, such as a situation which would cause fear?
8. How large are the parathyroids and what is their function?
9. Name two of the several functions of the thyroid gland.
10. List the functions of the gonads.
11. Consult the Glossary for the meaning of the following: ante-, endo-, hormone, hyper-, hypo-, post-, posterior.

# 15

# THE NERVOUS SYSTEM

Like all other parts of the body, the nervous system is made up of billions of cells. The connections between these cell groups are not understood thoroughly even by those most expert in studying them. The cells of the nervous system have fibers, some very short, others extremely long, called processes. What we call a "nerve" is a bundle of nerve fibers and the nerve cell.

The nervous system consists of the brain, the spinal cord, spinal nerves or the autonomic nervous system, and the peripheral nerves, designated as such because they are nearest the surface. The brain lies within the skull and is protected by it. Outside and completely covering the brain and spinal cord are membranes called *meninges*. The blood supply to the brain is through blood vessels which are very numerous and very complicated.

The spinal cord lies within the bony spinal column. Although it is no wider than the thumb, it carries the very important communications system between the brain and the rest of the body. The peripheral nerves branch off the spinal cord and the spinal nerves. Each nerve is composed of a group of (1) *sensory fibers,* along which impulses go to the spinal cord and then to the brain to produce sensation, and (2) *motor fibers,* along which impulses go from the brain to produce movements.

Both the brain and the spinal cord are composed of gray matter (nerve cells) and white matter (nerve fibers), with the gray matter

on the outside of the brain, just beneath the meninges, whereas in the spinal cord, the gray matter is on the inside

## THE BRAIN

The brain may be roughly divided into (1) the cerebral hemispheres, or cerebrum, (2) the cerebellum, (3) the hypothalamus, (4) the pons, and (5) the medulla oblongata

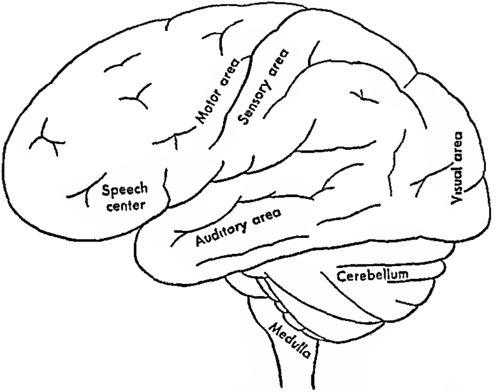



*Fig 25 There are localized areas for sense perception, consciousness reasoning, and voluntary action in the cerebrum* (Williams, Jesse *Healthful Living*, 4th ed The Macmillan Company, New York, 1947 )

The cerebrum is the largest part of the brain It is a folded mass of gray matter on the outside, and white matter on the inside The cerebrum is composed of two halves, called hemispheres, divided longitudinally (from front to back of the brain)

Stimuli are received by way of the sensory nerves, and in response the impulses for movement are relayed to the motor nerves in different parts of the cerebrum Thought and memory may become dis-

ordered if the cerebrum is damaged extensively by disease or injury; loss of memory is one of the earliest signs of such a condition.

The cerebellum is a folded mass of gray and white matter situated at the back of the skull underneath the cerebrum. It acts as the regulator of body movements and body postures, and makes possible smooth and harmonious working of the muscles of the body.

The hypothalamus lies above the cerebellum and below the cerebrum. It participates in the control of metabolism and is particularly important in the interpretation and control of emotions.

The pons and the medulla oblongata lie at the base of the brain and connect it with the spinal cord. These structures contain the centers which control movement and sensation around the head and face, as well as the centers which regulate breathing and heart rate.

Different areas of the brain are concerned with vision, hearing, touch, temperature, pain, and position. There are many brain structures concerned in producing the steady, ordered sequence of muscle activities which constitute normal movements of the body.

Damage to an area on one side of the brain will produce symptoms on the opposite side of the body, as seen particularly in regard to vision, sensation, and speech, because the nerve tracts crisscross in the pons.

## AUTONOMIC NERVOUS SYSTEM

The autonomic, or involuntary, nervous system regulates those structures over which there is *no conscious* or *voluntary* control. The glands, the blood vessels, the bronchial tubes, the gastrointestinal tract, and the genitourinary tract have fibers from the autonomic nervous system which act independently of consciousness, so that the function of these areas continues during sleep or coma.

## SENSORY AND MOTOR NERVES

Much of the nervous system works largely on the basis of reflexes. All reflexes have a sensory element; that is, a message is sent through a sensory nerve to the spinal cord or brain: then a motor response is sent through a motor nerve to produce an action. Some of the simplest reflexes are used by physicians in testing nervous activity. Thus, the knee jerk is a simple reflex in which the

stimulus, or sensation, is the tap on the tendon, and the motor response is the quick kick at the knee When one touches a hot stove, the heat is the stimulus, and the quick withdrawal of the hand is the response The examples given are extremely simple reflexes, but many more complicated ones enter into nervous function

### THE CEREBRAL CORTEX

The cortical area of the cerebrum, that is, the outer gray part, is believed to be the portion of the brain where learning takes place and is considered the base of intelligence It organizes responses and facilitates and inhibits actions of the lower centers of the nervous system

## *SUMMARY*

The nervous system is made up of a large number of cells, whose connections with each other are only partly understood even by scientists

The principal parts of the nervous system are the brain, the spinal cord, and the spinal nerves

The brain is protected by the skull, and the spinal cord by the vertebrae of the spinal column These structures are also surrounded by protected membranes called meninges The spinal nerves come off the spinal cord and carry impulses either to the spinal cord or brain, or from them to different parts of the body

The brain is divided into the cerebral hemispheres, the cerebellum, the hypothalamus, the pons, and the medulla oblongata

The nervous system works largely on the basis of reflexes, all of which have sensory elements The autonomic nervous system regulates those structures over which we have no conscious control, thus the systems which have fibers from the autonomic nervous system are able to function regardless of consciousness

### Questions

1 List the parts of the nervous system
2 Name the membranes which protect the brain and the spinal cord

3. Name the divisions of the brain.
4. Which is the largest part of the brain?
5. Which part of the brain is the regulator of movement?
6. Which part of the brain is the regulator of the heartbeat?
7. Which divisions of the brain lie at its base?
8. Which side of the body is affected if the right side of the brain is injured?
9. Of what are the brain and spinal cord composed? Of what are these substances composed?
10. Consult the Glossary for the meaning of the following: afferent, auto-, ganglion, hemi-, peri-, periphery, sympathetic.

# 16

# ANATOMY AND PHYSIOLOGY OF THE EYE AND EAR

## *THE EYE*

The eye is a nearly round ball about an inch in diameter It is situated in the *orbit,* the bony walls of which cavity serve to protect the eyeball The eye is surrounded by soft fat, which permits it to move without injuring the many nerves and blood vessels which enter the eyeball from the orbit

The eyes are moved by six muscles attached to each eye and regulated by an elaborate nerve mechanism

The cornea Since the function of the eye is to perceive light, especially color, form, and movement, it is necessary for the light to enter the eye This it does through the cornea, which is the transparent window about half an inch in diameter, clear and shiny as glass, and constantly moistened by the tears The cornea is convex and acts as a convex lens, thereby helping to focus light or an image on the retina

The lids cover and protect the cornea and by automatic winking wipe away any dust or foreign substance, such as bacteria, which often light upon it

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The sclera. The rest of the outer layer of the eyeball is called the sclera; it is the white of the eye, very strong and tough, and rarely subject to disease.

The iris is the colored part of the eye—blue, gray, brown, and so on. In its center is a round hole, the pupil, which varies in size, depending on the amount of light. In bright light the pupil contracts; in dim light it dilates, thus controlling the amount of light which falls on the retina.

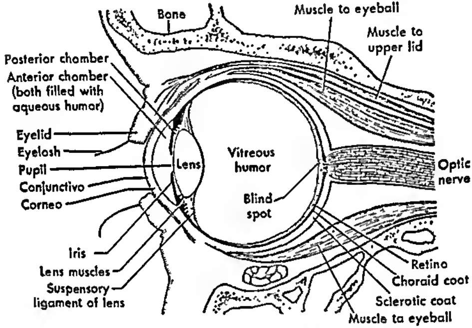


FIG. 26. *Vertical section of the human eye and associated structures. Diagrammatic.* (Woodruff, Lorande L., and Baitsell, George A.: *Foundations of Biology*, 7th ed. The Macmillan Company, New York, 1951.)

After the light passes through the cornea, it goes through the space between the cornea and the iris called the anterior chamber, which is filled with a watery fluid—the aqueous humor.

The lens. Just behind the iris is the lens. This is about the size of a large pea, but flatter. With the cornea, it focuses the light so that the rays form an image on the back of the eye inside, like the image made by the camera lens on the photographic film in the back of a camera. Between the lens and the back of the eye, the space is filled by the transparent jelly called the vitreous humor. The *retina,*

which lines all the inside of the back of the eye, is so sensitive to light that when an image is formed upon it, the stimulus of the light starts a nerve impulse which is transmitted to the brain, thus reaching consciousness as a sensation of color and form

## *THE EAR*

The ear serves as an organ for hearing and also as a means for maintenance of equilibrium, or balance It functions with extreme delicacy

The balancing function of the ear is most easily illustrated by the result of rapid turning or spinning, as in dancing, the dizziness which occurs is caused by inner-ear stimulation

The external ear is more than what the layman sees as the ear (*auricle*) It includes a canal, the *external auditory canal,* which goes inward for about an inch to reach the *eardrum* Also a part of the external ear, the eardrum is very thin and vibrates easily

The middle ear is a cavity which lies beyond the eardrum It contains three small bones called the *malleus* ("hammer"), the *incus* ("anvil"), and the *stapes* ("stirrup") They are shaped as their English names suggest These bones articulate with each other The largest bone, the malleus, is partly embedded in the drum, so that sound waves striking the drum are conveyed through the other little bones to the internal ear

From the front part of the middle ear near the inside of the drum anteriorly, the *Eustachian tube* passes as a small canal about an inch and a half long to a part of the throat which lies behind the nose The Eustachian tube ending in the throat is close to the adenoid tissue Adenoid infection may often cause middle-ear disease

An opening in the upper back part of the middle ear cavity leads into the *mastoid,* a process on the temporal bone If you put your finger behind the auricle, you will be touching the *mastoid process* The mastoid is usually honeycombed with interconnecting air cells leading eventually to the middle ear

Internal ear The air vibrations are conveyed by means of the external canal, through the drum and little bones, to the internal ear, which lies deep in the head beyond the middle ear This internal

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# PART III

## *Foods: Their Function or Use in the Body*

ear is composed of two chief structures. First, the *cochlea,* a spiral coil, contains the nerve endings floating in a liquid. The air vibrations, conveyed as above, affect these nerve endings and are sent to a hearing center in the brain. Then, secondly, there are three small *semicircular canals* lying in three different planes. These canals also contain nerve endings and a liquid, the motion of which gives us our idea of space and maintains our balance.

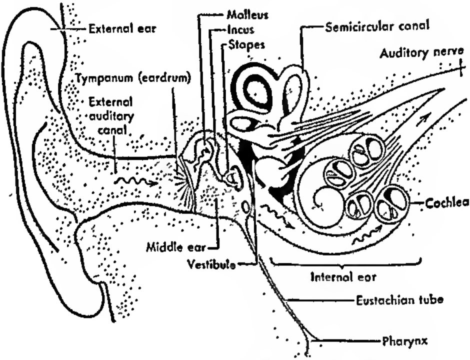


Fig. 27. General structure of the human ear, showing the mechanism of hearing and equilibrium. (Hegner, Robert W., and Stiles, Karl A.: *College Zoology,* 6th ed The Macmillan Company, New York, 1951.)

## *SUMMARY*

The eye. The eye, a round ball about an inch in diameter, is protected from injury by its position in its orbit and by being surrounded by soft fat. It is moved by six muscles in each eye, all regulated by the nerve mechanism. The parts of the eye are the cornea, the sclera, the iris, and the lens. The back of the inside of the eye

is called the retina. The function of the eye is to make it possible for the brain to perceive light, especially color, form, and movement. The light enters the eye in a regulated amount and is focused to produce an image on the retina. The stimulus of light on the retina is transmitted to the brain, thus reaching consciousness as a sensation of color and form.

The ear. The ear has two very delicate functions: (1) to act as the organ of hearing and (2) to enable the body to maintain its equilibrium. The ear has three main divisions: (1) the external ear, (2) the middle ear, and (3) the internal ear. The external ear picks up vibrations in the air; the middle ear transmits sound waves through its three small bones from the eardrum to the internal ear; and the internal ear, by means of a spiral coil containing floating nerve ends, sends impulses to the hearing center of the brain. In addition, the internal ear contains semicircular canals which have nerve ends floating in them. Impulses sent by these nerves give us our ideas of space and maintain our balance.

## Questions

1. Where is the eye situated? What is the function of this cavity?
2. How does light enter the eye? How is this part lubricated?
3. What is the function of the eyelid? How does it perform this function?
4. What is the function of the sclera?
5. Note the different colors of eyes in those around you. What is the name of the colored part of the eye?
6. Locate the pupil. Why does it change in size?
7. Locate the lens. How large is it? With what does it work to focus the image?
8. What is the most sensitive part of the eye? Where is it located?
9. What is the function of the ear?
10. Name the parts of the ear. Of what does each part consist?
11. How long is the Eustachian tube? Near what mass of lymphoid tissue does it end?
12. The opening back of the upper part of the ear leads to what cells?
13. Explain the part of the ear which gives one a sense of space and balance.
14. Consult the Glossary for the meaning of the following: aqua, audio-, aural, meso-, ophthalmo, oto-.

# 17

# FOOD: THE FOUNDATION OF GOOD HEALTH

## *THE FOOD WE EAT AND WHY WE EAT IT*

We all eat in response to hunger, but we are also aware that eating can be fun, that it promotes sociability To eat food from other lands widens our experience, indeed, it is often an adventure in itself

Although most of us like to eat, we generally turn to those foods we find attractive and do not give much thought to those which produce healthy growth, build resistance to fatigue, promote good looks, or contribute to physical well-being Few of us still in good health compare what we eat with a food guide adapted to our particular needs

The practical nurse desires to be attractive—to have good teeth, strong bones, lithe muscles, a clear complexion, glossy hair, smooth firm nails, and the power to resist infection—but she does not always realize or remember that these features are attained largely through eating proper foods As one of the essentials in making life worth while to herself and in maintaining her values to society, she will surely wish to acquire a sound core of knowledge about foods and their nutritional values

Her particular food needs will probably differ from those of any of her patients, for not only do the requirements of the body vary in health and in disease but they vary under different disease conditions. Fundamentally, food does four things:

1. Promotes growth of new tissue
2. Repairs old tissue
3. Yields heat and energy
4. Regulates body processes

If she knows this, then the practical nurse is ready to consider in more detail the groups of foods on which people can live well and without which their nourishment would be deficient. The most important foods are sometimes grouped together and called the *basic seven*. In the following list, each number represents a different group:

1. Green and yellow vegetables; 1 serving a day
2. Oranges, tomatoes, grapefruit, raw cabbage, salad greens; 1 serving a day
3. Potatoes and other vegetables, fruits; 2 or more servings a day
4. Milk and milk products; 1½ pints to 1 quart a day for children; 1 pint a day for adults; 1 quart a day for expectant or nursing mothers
5. Meat, poultry, fish or eggs, dried beans, peas, nuts, or peanut butter; 3 or 4 eggs each week; 1 serving of meat, poultry, or fish a day; occasionally peas or beans instead
6. Bread, flour, and cereals (natural whole grain or enriched or restored); at least 2 or more servings a day
7. Butter and fortified margarine (with added vitamin A); use for a spread and for seasoning as you like and supplies permit

In addition, both growing children and expectant mothers need 400 units of vitamin D. Vegetarian diets substitute liberal amounts of cheese, eggs, milk, dried legumes, cereals, and nuts for the animal products named in group 5. Other foods, or additional servings from these groups, may be added to supplement this basic selection. There is no reason why second servings from groups 4 and 5 may not be included if the family can afford to provide them.

Although most food facts have become established, others are constantly being added. The practical nurse will wish to keep abreast of the progress being made in nutrition and diet therapy. Nutrition is the science concerned with food in its relation to the growth and repair of living tissues.

Although many tend to eat only what they like, the power to enjoy new foods and novel methods of cooking and serving not only will help to make eating more pleasant but it opens the way to improvement in nutrition. However, if no thought is given to intro-

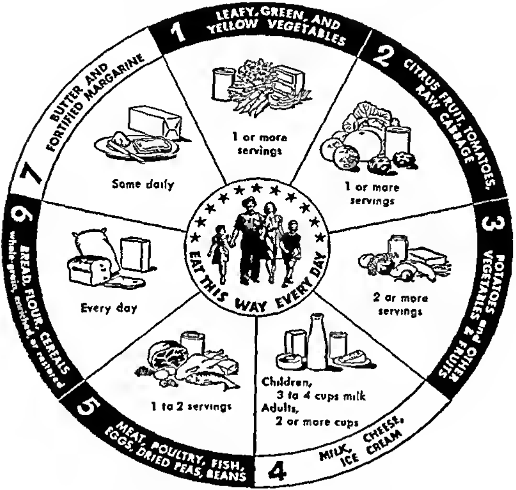


FIG. 28. The basic seven food groups. (Courtesy of the Bureau of Human Nutrition and Home Economics, U.S. Department of Agriculture, Washington, D.C.)

ducing in the diet more of the basic and nourishing foods in more appropriate quantities, the way may be closed to much general improvement in the physique. Flexibility of taste is best promoted in youth, but it may be developed in later years (1) by adapting or modifying racial customs, (2) by knowing how to cook and season foods well, (3) by having regular meal hours, (4) by taking pride in

setting the table attractively, and (5) by having the meal run smoothly and pleasantly.

Since the costs of food have been constantly rising, the practical nurse will realize that a costly meal is not necessarily a good one nor is a good meal always an expensive one. To live on the average food budget, however, she needs to understand how to plan inexpensive meals which are nourishing and well balanced and adequate to the needs of the body from childhood to old age.

In addition, she should be skilled in promoting good cheer at mealtimes in her patient's home. Reliable studies have shown that the digestion of food is affected by the emotions. Unhappy states of mind retard or stop digestion. Therefore, only pleasant thoughts should be expressed at the table or at the patient's bedside while he is eating.

It is evident, then, that a knowledge of nutrition and skill in preparation of food are fundamentally of personal interest to the practical nurse and to her patient, besides affecting the former's value to her community. She will be eager to acquire a solid background in food science, together with a knowledge of the relation of diet to the other health factors: (1) rest and sleep, (2) sunshine and fresh air, (3) exercise and play, and (4) particularly to the necessity of drinking plenty of water.

We have learned that our bodies are built of tiny units called cells. In the same way, all food is built of simple substances called elements, which combine to form the nutrients or foodstuffs needed by the body. These nutrients are divided into six classes:

| | |
|---|---|
| Carbohydrates | Minerals |
| Fats | Vitamins |
| Proteins | Water |

Carbohydrates, fats, and proteins serve as sources of energy.

Proteins, minerals, vitamins, and water are needed to develop the body and to promote growth.

Minerals, vitamins, and water regulate such body processes as circulation, digestion, and respiration.

## CARBOHYDRATES

Carbohydrates are the most abundant of all these six classes and are among our cheapest foods. Carbohydrates are composed of

three elements: carbon, hydrogen, and oxygen. These same elements are found in our bodies and must be constantly replaced to maintain health and growth.

Carbohydrates are divided into several groups—sugars, starches, and cellulose. All starches and sugars are changed in the body to a simple form called glucose.


FIG 29A. Fifteen grams of carbohydrate or starch are contained in each of the following items The same amount of sugar value is contained in:

| | | | |
|---|---|---|---|
| 1 cup cold cereal | ½ cup cooked cereal | ⅓ glass orange juice | 1 glass milk |
| ½ cup cooked rice | 1 small potato | 1 medium-sized apple | 1 orange |
| ½ cup cooked corn | ½ cup cooked macaroni | 1 slice bread | 1 large carrot |

Other fruits, vegetables, and cereals can be substituted for those pictured. (Courtesy of Medichrome-Clay-Adams, New York, Dr Henry Dolger, and the New York Diabetes Assocation.)

Cellulose is a fibrous material which is not digested by the body and has no value as an energy food. Its chief value is to provide bulk to the intestinal content. Since this bulk aids in carrying the food slowly through the digestive tract, it helps to prevent and overcome constipation.

Sources of carbohydrates. Most of the carbohydrates are found in the vegetable kingdom.

Sugars are found in cane sugar, beets, maple sap, fruits, honey, and some vegetables.

Starches are found in grain products, such as flour and cereals. All vegetables contain some starch; potatoes have a great deal.

Cellulose is found in whole-grain cereals and flours and especially in the skins of fruits and vegetables.

Function of carbohydrates. Carbohydrates have one function in the body—to yield heat and other forms of energy. Just as a steam engine needs fuel in the form of coal as a source of heat and energy, our bodies need fuel in the form of certain foodstuffs, mainly carbohydrates.

When we burn coal, what happens? The coal, plus oxygen from the air, burns to give energy, mainly heat. Carbon dioxide and water are thrown off as waste products. The same thing happens to our food. The food unites with the oxygen which we breathe in through our lungs to give the body heat and energy. The waste products are carbon dioxide and water. When we burn coal in a steam engine, heat is given off. The heat makes steam, which supplies the energy used by the engine to pull cars along with it. The energy given off by our food makes it possible for us to work as an engine works. A small amount of carbohydrate is stored in the muscles and in the liver as *glycogen*. This is quickly and easily changed into energy. When an excessive amount of carbohydrate is eaten, the amount not needed by the body for energy is changed into fat and stored in the tissues.

Digestion of carbohydrates. Food undergoes certain changes from the time it enters the body until it is assimilated by the cells. "Assimilated" means the process by which the cells absorb or take in the food elements.

These changes begin in the mouth when the food must be well chewed to allow the saliva to mix with it and begin to break down the starch into sugar. If a common cracker is chewed for some time, it tastes sweet, a change which shows that this digestive process has begun.

The next change is in the stomach, where the food is broken down and mixed with gastric juices.

The process of the breakdown or digestion of carbohydrates to glucose is completed in the intestines

**The importance of starch and sugar.** Starch and sugar are both important foods, for they are a relatively inexpensive source of energy

Starch should supply a large part of our energy It is composed of tiny granules, each of which has a wall of indigestible material called cellulose As starch cooks, each grain absorbs water until the wall bursts At this point, the heat and water change the starch into more simple substances Cooking not only makes starch more easily digestible but it improves its flavor The cellulose also is made softer by cooking

Sugar in small amounts is not harmful, but three good reasons may be given for avoiding an excess of sweets

1 Sugar is likely to take away the appetite for more important foods needed to supply vitamins and minerals
2 Sugar irritates the lining of the stomach
3 Sugar ferments readily, causing the formation of gas, which is both irritating and uncomfortable

Sweets in moderate amounts may be eaten at the end of a meal, for if sugar is mixed with other foods or beverages, its irritating effects are reduced

If a child has a craving for sweets, his diet should be checked as to the kind and quantity of foods it contains, and the doctor should be informed of his longing

## FATS

Fat contains the same three elements as carbohydrates—carbon, hydrogen, and oxygen—but in different proportions

**Sources of fat.** Fat is found in milk, butter, cream, lard, bacon, fat meat, egg yolk, corn oil, cottonseed oil, coconut oil, peanut oil, nuts, some kinds of fish, and olives Many of our vegetable fats are made from vegetable oils

**Function of fats** Both carbohydrates and fats give energy, but fats are richer, giving twice as much energy, weight for weight, as carbohydrates One tablespoon of fat has twice as many calories for energy as one tablespoon of sugar

When fat is taken in excess of the amount needed for energy, it is stored in the fatty tissues of the body to be used as a reserve supply of fuel for energy. These fatty tissues, known as adipose tissues, serve to protect the body against injury and prevent the rapid loss of heat.

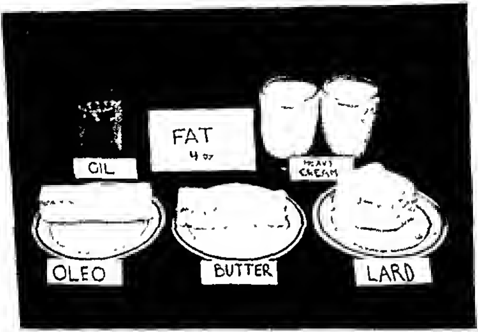


FIG. 29B. Fat equivalents. Four ounces of fat (or 120 grams) are contained in each of the following:

½ cup vegetable oil
¼ pound of oleo
¼ pound of butter
1 pint heavy cream
¼ pound of lard

(Courtesy of Medichrome-Clay-Adams, New York, Dr. Henry Dolger, and the New York Diabetes Association.)

Digestion of fat. Digestion of fat takes place mainly in the small intestines. It is not digested in the mouth nor to any great extent in the stomach. Until the contents of the stomach are well mixed with the gastric juices, they do not enter the intestines to be further digested.

While fat is in the stomach, it delays the digestion of proteins and carbohydrates by retarding the flow of the gastric juices. When a large amount of fat is taken, the food stays in the stomach longer than it should, and fermentation may take place, thereby causing digestive disturbances.

Soft fats such as those found in egg yolk, cream, and butter are more easily digested than hard fats

Fried foods coated with fats are digested very slowly and often cause disturbances The amount of fried food in the diet should be limited Children and people with impaired digestive systems should not eat fried foods

Some fats are much better than others to use for frying All fats, if heated to a high enough temperature, break up to form substances disagreeable to taste and smell and difficult to digest Butter breaks at a very low temperature We usually speak of butter as burning when these changes take place in it Since vegetable oils such as Crisco and Spry break at a very high temperature, they are better to use in frying than butter

## PROTEINS

Proteins are composed of carbon, hydrogen, oxygen, nitrogen, and usually sulfur Nitrogen is a necessary part of every living cell in both plants and animals Protein is the only source of nitrogen for animals, therefore it must be included in everyone's diet Proteins are built up of simple substances called amino acids Each protein has a different composition according to the number of amino acids it contains

Sources of proteins Proteins are found in meat, eggs, fish, cheese, milk, gelatin, whole grain cereals, flours, and in vegetables in varying amounts Those found in meat, eggs, cheese, fish, and milk are called complete proteins, as they will both build new tissue and repair old tissue Those found in gelatin, cereals, flours, and vegetables are called incomplete proteins, as they will only repair old tissues Therefore the complete proteins are most necessary in the diet

We have recently learned that there should be some animal or complete protein eaten at each meal, for instance, include egg or milk at breakfast, a serving of meat or fish or poultry at dinner, and perhaps a cheese dish at the midday or supper meal

Milk furnishes the best type of protein food for children

A medium serving of meat once a day, this meat being supplemented by other protein food, will supply all the protein needed by

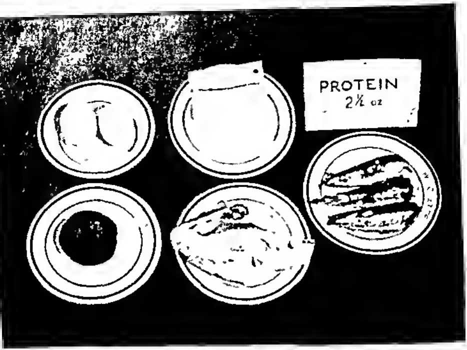


FIG. 30. Protein equivalents. Two and one-half ounces of protein (or 75 grams) are contained in a total of:

- 2 eggs
- 2 ounces of raw hamburger
- 3 medium slices of American cheese
- 2 ounces of chicken
- 3 large sardines

Other kinds of meat, fish, poultry, or cheese can be substituted for these items in about the same amounts. (Courtesy of Medichrome-Clay-Adams, New York, Dr. Henry Dolger, and the New York Diabetes Association.)

the average person. Meat more than once a day raises the food budget beyond that necessary for the average family.

**Function of proteins.** Proteins have three functions or uses in the body:

1. They build new tissue—promote growth.
2. They repair old tissue—maintain life.
3. They may be used for energy.

The first two functions are the most important. Body cells are constantly being worn out and lose nitrogen as a waste product. This nitrogen must be replaced in the cells by the nitrogen found in protein foods.

Proteins may be used to yield energy when not enough carbohydrate or fat is taken into the body to supply the amount of energy needed The disadvantages in using proteins for energy are that proteins are a very expensive energy food, and as the body can use only a certain amount of nitrogen, the excess has to be excreted by the kidneys as a waste product

The digestion of protein begins in the stomach and is finished in the intestinal tract

## MINERALS

The five elements previously discussed—carbon, oxygen, hydrogen, nitrogen, and sulfur are not the only substances necessary in the body A number of others are usually classified under one general term—mineral, or ash

| | | |
|---|---|---|
| Calcium | Fluorine | Phosphorus |
| Chlorine | Iodine | Potassium |
| Copper | Iron | Sodium |

Calcium, iron, copper, and iodine are the minerals most likely to be low in our diet

Function of minerals Minerals have three general functions in the body

1 They form the hard tissue such as bone and teeth
2 They are part of tissues, such as muscles and blood
3 They regulate body processes, such as digestion and circulation

Each mineral has a special use in the body, but it is necessary to discuss only the most important

Calcium builds bone and teeth Children need an especially large amount of calcium for the growth of good bones and teeth The pregnant woman needs twice as much calcium as normally in order that the forming child may have good bones and teeth If her diet does not supply enough of this mineral, the amount needed will be drawn from the supply in her own bones and teeth The result is that after childbirth she finds that her teeth need a great deal of attention If she nurses the baby, she needs two and one half times the normal amount of calcium

Calcium helps to regulate the heartbeat, the nerve action, and the muscle action

## SUMMARY CHART OF MINERALS

| NAME | IMPORTANT SOURCES | PHYSIOLOGY AND FUNCTIONS | EFFECT OF DEFICIENCY |
|---|---|---|---|
| Calcium | Milk<br>Cheese<br>Molasses<br>Egg yolk<br>Dry beans | Helps build bone and teeth<br>Is necessary for clotting of blood<br>Helps regulate heartbeat, nerve and muscle action | Malformed bones and poor teeth<br>Hemorrhaging |
| Phosphorus | Protein-rich food<br>meat<br>fish<br>eggs<br>cheese<br>Milk | Functions with calcium in building bones and teeth<br>Helps to regulate the functioning of the nerves | Malformed bones and poor teeth |
| Iron | Liver<br>Egg yolk<br>Molasses<br>Dried fruits | Is an essential part of the hemoglobin of the blood<br>Hemoglobin carries oxygen to all tissues of the body | Nutritional anemia<br>Paleness, dizziness, loss of weight |
| Copper | Widely distributed in foods | Aids in formation of hemoglobin, but not a part of it | Same as for iron |
| Iodine | Sea foods<br>Fruits and vegetables grown near the sea<br>Iodized salt | Is necessary for normal functioning of the thyroid gland | Some types of goiter |

One quart of milk for the child and one pint for the adult each day will furnish the required amount of calcium

PHOSPHORUS is an essential element in the body and, like nitrogen, is found in every living cell Phosphorus helps to regulate the functioning of the nerves and is an essential part of the bones and teeth If both calcium and protein requirements are met, it is very likely that enough phosphorus will be present in the diet

IRON is an essential part of the hemoglobin of the blood The hemoglobin carries oxygen to all parts of the body When iron is lacking in the diet, there may be insufficient hemoglobin to do this work

COPPER is closely associated with the utilization of iron for building hemoglobin Most food sources of iron also contain traces of copper Liver is one of the richest sources of both iron and copper

IODINE is necessary for the normal functioning of a gland in the throat called the thyroid Too little iodine in the diet results in a condition called goiter, which is an enlargement of the thyroid gland

The remaining minerals are so widely distributed as to be seldom lacking in our diet Sulfur is found in all protein foods, potassium in nearly all foods, and sodium and chlorine in table salt

Cooking foods containing minerals Most of the minerals in our food occur in the form of salts which are soluble in water An example of this is table salt, which dissolves in water When vegetables are cooked in water, the mineral salts dissolve and are lost when the water is thrown away Mild flavored vegetables should be cooked in a small amount of water to avoid this loss, and the water should be saved as a foundation for soups

## VITAMINS

Vitamins are substances essential to an adequate diet They are like an ignition spark of the automobile, says Professor Rose * There are many well known vitamins, those most generally accepted as necessary for human nutrition are vitamin A, vitamin B complex and vitamins C, D, E and K

Although the liver forms vitamin A from carotene and we make our own vitamin D from the sunlight, most of the vitamins which we value today in nutrition are formed in green plants Scientists are

* MacLeod, Grace and Taylor, Clara Mae (editors) *Rose's Foundation of Nutrition*, 4th ed The Macmillan Company, New York, 1944, p 189

constantly learning new facts about them and their uses in the body; they use animals, especially white rats, to study the effect and value of vitamins. These animals, which reproduce rapidly and which have a short life span, react to vitamin deficiency in much the same way as human beings.

As long as the diet contains an adequate supply of vitamins, their importance is not realized. It is the lack of them in the diet that causes disease or conditions such as poor growth.

A few of the most important facts about vitamins follow. It is not possible in this brief discussion to enumerate all the known vitamins and their functions.

Functions of vitamins. The vitamins have three functions:

1. To promote normal growth
2. To promote normal health
3. To promote normal functioning of body processes

VITAMIN A. *Sources of vitamin A.* This vitamin is contained in certain fatty foods, such as butter, fortified margarine, cream, whole milk, cream cheese, eggs, and fish-liver oils. It is also found in the liver and kidneys of all animals. Carotene, a substance found in green and yellow vegetables and fruits, is converted into vitamin A in the body. The thin, green outer leaves of lettuce and cabbage contain more vitamin A than the bleached inner leaves and should not be discarded.

*Functions of vitamin A.* Vitamin A helps eyes adjust from light to darkness, helps prevent night blindness, and builds healthy mucous membrane.

When rats are fed diets containing all other food essentials but vitamin A, they soon stop growing, lose weight, and finally die. Many of them develop a certain eye disease. Provided the condition of the animal has not become too serious, it is possible to cure the eye disease and promote growth considerably by adding to the diet foods containing vitamin A.

It has been demonstrated that the mucous membranes lining the throat, nose, alimentary canal, and genitourinary tract show a change when vitamin A is lacking in the diet and that this change makes these tissues more susceptible to infection. A liberal supply of vitamin A may increase resistance to, or decrease the severity of,

colds and similar diseases by keeping the mucous membranes that line the nasal passages in a healthy condition

Night blindness is a disturbance in the ability of the eye to adjust itself quickly from light to dark and from dark to light It has been found that a liberal amount of vitamin A will help to restore this function to the eye

Since vitamin A may be stored in the body, this reserve gives the body greater resistance to infections of various kinds and promotes good health and vigor Because of these facts, we should include in our diets foods rich in vitamin A, especially in the winter when colds are so prevalent

B COMPLEX VITAMINS Thiamin, riboflavin, and niacin are the most prominent members of this group Two other members of this group are $B_{12}$ and folic acid

*Sources of thiamin* Such whole grain products as oatmeal, graham flour, and entire wheat flour are good sources of thiamin, because the whole kernel which contains the germ is used The germ is part of the kernel which is rich in thiamin In refined cereals the germ and the outer coating of bran are removed in the milling process Products which have been enriched or restored are available on the market Vegetables, fruits, milk, eggs, liver, and kidneys contain thiamin in varying amounts

*Functions of thiamin* Thiamin helps to promote appetite and muscle tone of the digestive tract This substance has been called the "morale vitamin" since the earliest signs of its lack also show its effect on the nervous system Symptoms of a deficiency of thiamin include loss of appetite, poor digestion, constipation, and rapid loss of weight, followed by nervousness and irritability Complete lack of this vitamin causes the disease beriberi

Since thiamin cannot be stored in the body, an adequate amount must be supplied regularly in the diet

*Sources of riboflavin* This member is found mainly in eggs, milk, green leafy vegetables, lean meat, and yeast It is also found in the whole grain cereals or in enriched bread and cereals

*Functions of riboflavin* Riboflavin is necessary for the normal health of the hair and skin A lack of riboflavin in the diet may result in cracks at the corners of the mouth and itchiog and burning of the eyes

*Sources of niacin.* This vitamin is most widely found in milk and milk products, such as cream and ice cream, and in green leafy vegetables and fresh meat. Whole-grain or enriched cereals and breads are also good sources of niacin.

*Functions of niacin.* This vitamin is necessary for the normal health of the skin and nerves. A lack of niacin in the diet may result in a sore tongue, red scaly skin, and also digestive and nervous disturbances. A complete lack of niacin causes a disease known as pellagra.

VITAMIN C. *Sources of vitamin C.* This vitamin is found mostly in fresh fruits and vegetables, but the quantity is extremely variable. Citrus fruits, mainly oranges, lemons, and grapefruit—fresh, canned, or frozen—are the best sources. Tomatoes and raw cabbage are good sources. The potato retains a large amount of its vitamin C only if it is left whole and baked, boiled, or steamed.

*Functions of vitamin C (ascorbic acid).* Vitamin C is necessary for the growth and health of bones and teeth. The lack of this vitamin in a child's diet is a contributing cause to early decay of teeth. Vitamin C prevents the disease known as scurvy. Infants are very susceptible to scurvy if their diet consists only of milk which has been boiled or pasteurized, as milk prepared by either of these methods is almost totally lacking in vitamin C. Recent experiments seem to show that the healing of cuts and wounds is hastened if the diet contains large amounts of vitamin C.

VITAMIN D. *Sources of vitamin D.* The richest sources of this vitamin are fish-liver oils. Egg yolk, liver, milk, and butter contain vitamin D in variable amounts. The skin contains a certain substance which the ultraviolet rays in the sunlight may change to vitamin D. It is not always possible to get the benefit of this natural source of ultraviolet light, as the rays vary with the season and locality and may be filtered out by fog, smoke, and ordinary window glass.

One method of adding vitamin D to food is to expose it to ultraviolet rays. This process is called irradiation. Milk so treated is called irradiated milk and is an excellent source of vitamin D.

*Functions of vitamin D.* Vitamin D prevents rickets, a disease of the bones. Since food sources of vitamin D are limited and it is not always possible to obtain enough sunlight to get an adequate supply, some supplementary source is necessary. Fish oils, viosterol,

and fortified foods may be used as this source Lack of vitamin D is not the only cause of rickets, as too little calcium and phosphorus in the diet or wrong proportions of these minerals also bring about a rachitic condition

For the proper formation of bones and teeth, children must have vitamin D in large quantities It is also more necessary for the pregnant woman than for other adults to prevent tooth decay for herself as well as to build bones and teeth for her baby

VITAMIN E *Sources of vitamin E* This vitamin is found in variable amounts in vegetable oils, fresh lettuce, meat, and milk

*Functions of vitamin E* The observation of several generations of rats seems to show that normal reproduction depends upon the presence of vitamin E in the diet

VITAMIN K *Sources of vitamin K* This vitamin is found mostly in green leafy vegetables, although it is widely distributed and in a variety of foods is found in association with vitamin C

*Functions of vitamin K* It may be given in medicinal form when ordered by the physician This vitamin appears to have a definite relationship to the clotting of blood and, under certain conditions, to the prevention of hemorrhage

**Importance of vitamins in the diet** The average person probably gets enough vitamins in his diet to supply the minimum daily requirement and to prevent deficiency diseases, but many people do not get enough to ensure maximum health and vigor One of the best ways to ensure a diet rich in vitamins is to eat a wide variety of foods, such as milk, eggs all fruits and vegetables, butter, and whole grain or enriched cereals and flours

Vitamins in pill and capsule form are available, but *these must not be taken unless recommended by a physician who knows what the individual needs most* Since vitamins are measured by units the cost of the various preparations differs according to the number of vitamin units in each measured amount The label on the package states the number of units, it is therefore easy to check and to be sure of getting the right food value for the money spent

**Cooking and storage of foods containing vitamins** The proper cooking and storage of foods is very important, for many of the vitamins are destroyed by heat and exposure to air

VITAMIN A is gradually destroyed by heating in contact with air Animal fats lose vitamin A by exposure to air

B-COMPLEX VITAMINS are easily dissolved in water. When vegetables are cooked in water and the liquid thrown away, as much as one-half of the vitamin content may be lost. Heating to the boiling point does not destroy this vitamin, but higher temperatures destroy it rapidly.

There is little loss of B-complex vitamin when food is stored or dried. All vitamins are rapidly destroyed if soda is added to fruits and vegetables in cooking.

VITAMIN C is readily destroyed by heating, drying, and storing. It is soluble in water and dissolves out of vegetables during the first few minutes of cooking. Acid fruits and vegetables lose less of their vitamin-C content than do vegetables containing but little acid. Commercially canned fruits and vegetables lose less of their vitamin-C content than do home-cooked or home-canned ones. Fresh fruits and vegetables soon lose their vitamin C when left at room temperature and less rapidly when placed in the refrigerator.

**Rules for preserving maximum vitamin content of foods.** The following list of suggestions will help in preserving the vitamin content of foods purchased and thus in obtaining the most value from money spent.

1. Use as little water as possible to cook vegetables.
2. Water should be boiling when vegetables are added.
3. Cover the pan as tightly as possible, except for strongly flavored vegetables.
4. Cook as short a time as possible.
5. Avoid adding soda to water in which vegetables are cooked.
6. Heat canned vegetables, as quickly as possible, in their own liquid
7. Since more vitamins are lost from vegetables after they have been shredded or cut than before, they should be shredded just before they are served.
8. Save the water in which vegetables are cooked to use in soups and gravies.
9. Store vegetables in a cold place.
10. Avoid buying bruised or wilted vegetables.
11. Follow directions for storage and preparation on the package of frozen foods. Frozen fruit should be used promptly after thawing Frozen vegetables should be placed directly in boiling water immediately before they are to be cooked.
12. Use raw and fresh fruits and vegetables as often as possible.

# SUMMARY CHART OF VITAMINS

| NAME | IMPORTANT SOURCES | PHYSIOLOGY AND FUNCTIONS | EFFECT OF DEFICIENCY |
|---|---|---|---|
| Vitamin A (fat-soluble) | Butter and cream<br>Fortified margarine<br>Fish liver oils<br>Liver and kidney | Helps eyes to adjust from light to darkness | Night blindness |
| Carotene (changed to vitamin A in the body) | Green and yellow vegetables and fruits | Builds healthy mucous membranes<br>Promotes growth | May increase dangers of infectious disease |
| B complex vitamins (water soluble) | Whole grain breads and cereals | Promotes appetite | Poor appetite and/or loss of weight |
| | | Helps muscle tone of digestive tract | Constipation |
| | Legumes | Helps us to have healthy nerves and muscles | Depression inability to concentrate, irritability |
| Thiamin | Pork<br>Organ meats | Prevents beriberi | Development of polyneuritis |
| Riboflavin | Liver, lean meats<br>Eggs<br>Leafy vegetables<br>Legumes<br>Milk and its products | Is necessary for health of mouth, skin, and eyes<br>Promotes growth | Inflammation of the lips with cracking at the corners of the mouth<br><br>Poor condition of skin and eyes |

## SUMMARY CHART OF VITAMINS (*Continued*)

| NAME | IMPORTANT SOURCES | PHYSIOLOGY AND FUNCTIONS | EFFECT OF DEFICIENCY |
|---|---|---|---|
| Niacin | Organ meats<br>Poultry<br>Fish<br>Peanuts<br>Legumes | Promotes health of tissues<br>Promotes appetite and proper functioning of digestive tract<br>Prevents pellagra | "The three D's of pellagra—depression, dermatitis, diarrhea" |
| Vitamin C (water-soluble) | Citrus fruits<br>Tomatoes<br>Green cabbage | Helps build resistance to infection<br>Helps maintain healthy blood vessel walls<br>Is necessary for sound bones and teeth | Lowered resistance to infection<br>Tendency to hemorrhage and bruise easily |
| Vitamin D (fat-soluble) | Fish-liver oils<br>Liver<br>Butter<br>Sunlight on the skin<br>Irradiated milk and other foods | Works with calcium and phosphorous in building bones<br>Helps keep bones and teeth firm and sound<br>Helps prevent rickets | Stunted growth<br>Misshapen bones and tooth decay<br>Bowed legs and knocked knees |
| Vitamin E (fat-soluble) | Widely distributed in foods | Essential for normal reproduction in rats | |
| Vitamin K (fat-soluble) | Usually a laboratory preparation | Useful in coagulation of the blood in surgery and childbirth | Hemorrhaging<br>Extended clotting time of blood |

Vitamin chart The chart on pages 145–46, which summarizes vitamin physiology and functions, important sources, and effect of deficiency, will be helpful in referring to the vitamins previously discussed

## WATER

Water is one of the most essential of our foods

1 Water comprises 58 per cent of the human body It is found in all body tissues

2 Water carries food to various parts of the body and removes waste products

3 Water regulates the body temperature

4 Water aids digestion and absorption and helps to overcome constipation

The average person needs six to eight glasses of water each day One or two glasses taken before breakfast are helpful in overcoming constipation The remainder may be taken as desired The theory that to drink water at mealtimes is harmful has been disproved, for we know that water with our meals is an aid to digestion unless the water is used to wash down foods which have not been properly chewed

## ENERGY REQUIREMENTS

The fact that we can measure the oxidation of the body and thus learn the basal metabolism rate—taken while a person is completely at rest—underlies the great progress which has been made in diet therapy

Scientifically speaking, the food is burned or oxidized in the body to give us heat or energy This may be somewhat confusing, since we think of burning as being consumed by an actual flame, but it is more easily understood if we compare the process to the use of coal in a steam engine When coal burns, it provides power for the engine, and when food combines with oxygen in the body, this process provides energy

The unit of heat measurement is the calorie Although we require a good many qualities in our food, such as palatability, availability, and economy, we expect most of all that our food—especially

carbohydrate and fat and, to some extent, protein—will yield enough calories to balance the energy expended by the body at work.

In making up a diet, we select foods which will give us these calories and will also contain and carry to our tissues the minerals and vitamins we need.

Scientists working in laboratories with special apparatus which provides conditions similar to that of the human body have determined the energy or caloric value of food. The results prove that the number of calories or amount of energy in each food varies according to its composition, that is, the amount of carbohydrate, fat, and protein it contains.

One ounce of fat will provide twice as much energy or number of calories as either an ounce of carbohydrates or an ounce of protein. Minerals, vitamins, and water cannot be measured by calories, for they do not provide heat or energy.

Body compared to an automobile engine. The number of calories needed is different for each person, depending on many factors. This will be more easily understood if the body is compared to a gasoline engine in an automobile. The weight of the car, the size of the engine, the distance the car travels, and whether it goes uphill or down are all factors influencing the amount of gasoline needed. So in a human being the processes within the body, the weight, age, *sex*, and *physical activity* or *work of* the person, *all affect the* amount of energy or number of calories needed.

Factors influencing calorie requirements

1. *Age.* Children, in proportion to their weight, need more food than adults. Old people require less food.
2. *Size.* Large people usually require more food than small people.
3. *Sex.* Men need more food than women.
4. *Activity.* This is the greatest single factor influencing energy requirements. The activity may be voluntary, such as any use of the body —walking, standing, sitting, playing tennis, washing dishes, or ironing. In just the same way, energy is used for the involuntary processes within the body—digestion, circulation, and elimination.

Energy requirements are determined mainly by physical activity. A person awake needs more than a person asleep; a person sitting needs more than one lying down; a person standing, more than one sitting—that is, the more active a person is, the more energy or calories needed.

A young person who is underweight is never able to do his best work and is more susceptible to disease Therefore every effort should be made to bring his weight up to the proper standard In order to do this, he must not only increase the calories taken but must be sure that the diet contains sufficient vitamins and minerals. An overweight person who is trying to lose by reducing calories in his diet must be very careful not to eliminate the foods containing vitamins and minerals *Dieting to lose or gain weight should be done only under the supervision of a physician* Only a physician can decide about what each patient should weigh

In textbooks on dietetics are tables giving the caloric values of foods, and from these tables it is possible to find the number of calories eaten in a given meal or day, if either the weight or amount of food eaten is known

For instance, if it is desired to find how many calories are in two slices of bacon, the table may show that 60 calories are in one slice, therefore, two slices will yield 120 calories If it is desired to weigh food by grams, there are also tables with this information

**Food standards.** As skill and knowledge are required to determine the exact amount of carbohydrates, fats, proteins, vitamins, and minerals in our foods, it is difficult to tell when the diet contains sufficient of these food substances But we know that it is absolutely essential to include the seven basic or "must" foods in the daily diet in order to satisfy the requirements of the body (See p 128 for a listing of the seven basic foods )

## *SUMMARY*

Food fundamentally serves a fourfold purpose (1) in promoting the growth of new tissue, (2) in repairing old tissue, (3) in yielding heat and energy, and (4) in regulating body processes Seven basic groups of food, served in appropriate amounts, cover the general needs of the body

Nutrients are divided into six classes, all with their particular sources and functions carbohydrates, fats, proteins, minerals, vitamins, and water

Carbohydrates are vegetable products which yield heat and other forms of energy from the starches and sugars they contain,

their third constituent, cellulose, supplies roughage valuable in elimination of wastes.

Fats are derived from both vegetables and animals. They provide energy, which, if not used currently, is stored as adipose tissue.

Proteins are of two types: complete and incomplete. Their sources are both animal and vegetable. Their function is threefold: to build new tissue, to repair old tissue, and to supply some energy.

Nine minerals, especially, are needed to form hard tissue, to become a part of blood and muscle, and to regulate body functions such as digestion and circulation.

Vitamins are substances essential to an adequate diet. There are many well-known vitamins, the most important of which are A, B-complex, C, D, E, and K. Vitamins have three important functions: to promote (1) normal growth, (2) normal health, and (3) normal functioning of body processes.

Energy requirements vary with several factors. Energy itself is measured by the calorie, a measure or unit of heat.

## Questions

1. Name the basic seven groups of food.
2. How is digestion affected by good cheer?
3. Name some important sources of carbohydrates.
4. Trace the digestion of carbohydrates.
5. For what three reasons should an excess of sugar be avoided?
6. What elements are contained in fats?
7. Where does the digestion of fat mainly take place?
8. What happens when food stays too long in the stomach?
9. Name some important sources of complete proteins.
10. Name some sources of incomplete proteins.
11. Name several minerals necessary to the body.
12. Discuss each of the well-known vitamins under two topics: sources and functions.
13. Discuss the storage and cooking of foods that contain vitamins.
14. What factors influence the caloric or energy requirements of the body?
15. In what practical way can we find out the number of calories in a given portion of food?
16. Consult the Glossary for the meaning of the following: calorie, enzyme.

# 18

# MENU PLANNING

Since it is easier and more economical to do most of the marketing for the week at one time, it is sensible to plan meals for the family on a semiweekly or weekly basis In this way the ingredients needed will be on hand, the meals will tend to be better balanced and more attractive, and the leftovers can be used to advantage

The homemaker should therefore take quite a few things into consideration in ordering the week's supply of food and in planning the menus for the week To do this, she will have to combine foods in her menus in attractive and healthful ways She will always build her menus around the basic seven foods, for her primary objective is to meet the nutritive requirements of the body She will plan her order to include carbohydrates, proteins, and fats in proper proportions

Besides balance, she will stress variety, both to stimulate lazy appetites and to make sure that a wide range of vitamins and minerals is included Flavors, foodstuffs, color, consistency, arrangement, and garnishing can all be varied If the practical nurse is doing the planning, she should study her patient's likes and dislikes and consider his religion, financial status, nationality, and race, as they may affect his food preferences

**Breakfast.** For most people, breakfast is the most important meal of the day It should not be hurried or omitted Individuals who

eat a hasty or light breakfast do not get sufficient food or the right food to supply them with enough energy to last until noon. If breakfast consists of carbohydrates but lacks proteins and fats, the level of blood sugar will rise sharply at first and then drop suddenly as the carbohydrate is rapidly consumed. Without the long-lasting energy supplied by protein and fat, the individual sometimes feels shaky and often finds his energy depleted about the middle of the morning.

FIG. 31. Breakfast. (Courtesy of Swift & Company, Chicago, Illinois)

The amount of breakfast depends principally on the kind of work one does and the physical or mental energy expended. An adequate breakfast is necessary for the following reasons:

1. To supply fuel for the body after the night's fasting
2. To arouse and stimulate the appetite
3. To "stay by us" for the morning's work and avoid a midmorning letdown
4. To supply one-fourth to one-third of the nutrients needed for the day

Breakfast should begin with fruit or fruit juice, for it whets the appetite and starts the flow of digestive juices The kind of fruit chosen depends on the amount of money to be spent and the season of the year Fresh fruits are usually more expensive than dried fruits Citrus fruits are among the best sources of vitamin C

A well cooked hot cereal should be included in the breakfast for the school child It is an easily digested, nourishing, and inexpensive food Muffins or toast are usually served for breakfast Toast is the more suitable of the two for school children, as muffins are a soft food, easily swallowed without being thoroughly chewed Unless well mixed with saliva, starchy foods digest slowly

Eggs, meat, fish, and potatoes are served according to the heartiness of the breakfast desired

The beverage for the meal—milk, tea, coffee, or cocoa—depends entirely on the likes and dislikes of the adult person Milk should be the beverage for the school child

Dinner is the next unit to be considered It may come either at noon or at night

As this menu varies less than that of the luncheon or supper, it is not difficult to plan A dinner may be a very simple meal with only two courses, or it may be more elaborate

Soup or fruit may be served as a first course at dinner to stimulate the appetite As such, the soup should have a low food value, such as a consomme, or the fruit should be acid, such as tomato juice or grapefruit in a fruit cocktail

The main course consists of meat, fish, or poultry, potatoes, and one or two other vegetables Casserole dishes containing sufficient protein may occasionally be substituted for meat Salad is sometimes served instead of a cooked vegetable because a raw vegetable should be included in each day's menu A light salad such as tossed greens is preferable to a heavy one at dinner

The type of dessert chosen depends entirely on the rest of the meal A heavy main course requires a light dessert, a lighter main course allows a heavier dessert

Luncheon or supper Since luncheon may have only one main dish, something hearty should be chosen, such as macaroni and cheese with a salad or vegetable

The typical main luncheon dishes are soups (especially rich cream soups or chowders), salads sandwiches, vegetables with

sauces, cheese and egg dishes, combination vegetable and meat dishes, and fish in many ways. The kind of main dish chosen depends somewhat on the season of the year. For example, a hearty soup is ideal in winter, and a crisp, cold salad makes an attractive, appealing dish in summer. A dessert made with milk or egg, such as custard or tapioca, is suitable for winter, and fruit or gelatine is a good choice for summer. However, these foods are good the year round.

Luncheon for a child should always include milk as a beverage or in soup or pudding.

LEFTOVERS. Of course, a good cook realizes that, in general, foods freshly prepared are more palatable than leftover dishes. Thus she will plan as nearly as possible to cook about the quantity of food which will be consumed at one meal. A Sunday roast, for example, would be an exception. Leftover food should be used promptly and, with good planning, need never be wasted.

Nevertheless, it is often just as well to cook more than enough food for one meal when the food is to be chilled before serving or when, if properly covered, it will not deteriorate from one meal to the next. Many luncheon dishes, especially, are made of properly combined leftovers. Casserole dishes are very acceptable for luncheon. If there is the slightest possibility that food has been spoiled, discard it at once.

*Typical menu—low-cost budget*

| | |
|---|---|
| Breakfast: | Canned fruit juice or tomato juice<br>Oatmeal, milk<br>Toast, fortified margarine<br>Coffee, tea, or milk |
| Lunch: | Spanish rice, made with unpolished rice<br>Rye bread, fortified margarine<br>Carrot sticks<br>Raspberry Jell-O<br>Tea or milk |
| Dinner: | Baked stuffed haddock<br>Buttered sliced beets<br>Mashed potato<br>Tapioca, with fruits in season<br>Tea or milk |

*Typical menu—medium cost budget*

| | |
|---|---|
| Breakfast | Orange juice |
| | Hominy |
| | Bran muffins and butter or fortified margarine |
| | 3-minute egg |
| | Coffee or milk |
| Lunch | Toasted cheese and bacon open sandwich |
| | Waldorf salad |
| | Prune whip, with custard sauce |
| | Tea or milk |
| Dinner | Lamb casserole, potatoes, carrots, onions, string beans or peas |
| | Radishes and celery curls |
| | Peach shortcake |
| | Tea or milk |

*Note* Whenever dried skim milk is used, additional margarine should be included in the day's diet

## *COST OF FOOD*

The practical nurse will sometimes assume the entire charge of planning, preparing, and serving the meals for the family, as well as the responsibility of buying all the food for the family To be economical, she must, in addition to understanding food values, have a good idea as to what controls the cost of food

Some factors which influence cost are considered below

1 *Cost of transportation* Foods produced in Florida or California may cost very little in their local markets, but when the costs of packing, shipping and spoilage are added to the price, food is expensive

2 *Seasonal production* Foods out of season are usually more expensive because of the extra cost of transportation and extra cost of labor Potatoes are an example of this, also fish when the latter has to be transported to inland markets

3 *Cost of marketing* Food in packages usually costs more than if bought in bulk, but it is sure to be clean Small packages cost more, in proportion, than large However, it may be difficult to buy small amounts in bulk Packaged materials usually keep better Food will cost

more in credit and delivery stores than in cash-and-carry stores becaus of the extra cost of delivery and of carrying charge accounts.

4. *Supply and demand.* The quantity of a food available on th market and the demand by the public will influence the price.

Economical buying. The purchaser of foods who gets the mo for her money is the one who knows how to select foods which a palatable, high in food value, low in price, and seasonable.

*The following suggestions may be helpful:*

Plan menus three or four days ahead and list the foods neede for this period. Make substitutions if you find listed foods are hig or poor in quality.

Plan to shop twice a week for perishable food supplies, especial fruits and vegetables. Shop early in the morning when possible, sin service is better and supplies are fresher. One of the first rules good buying is to see for yourself what you are buying. You w know better what is in the market; you will know your grocer marketman, and he will know you.

Buy as large a quantity as possible except when foods will spoil when there is lack of storage room. Canned goods, flour, sugar, a some other staple products may be bought in large amounts.

Foods grown locally are generally the most economical.

Buy foods in season. Frozen foods are often cheaper as there no waste and less time is required for cooking.

Buy the grade of product best suited to your needs; for instan buy Florida oranges for juice, and California, or navel, for secti for fruit cups or salads. Broken slices of pineapple are suitable fruit cup; whole slices for serving plain. Large sizes, perfect shap and bright colorings all add to the cost of food products. Mediu sized fruit often has a better flavor than large, beautiful fruit. example of this statement is apples, which are often tasteless wl large and highly colored. Dried fruits are usually less expensive th fresh fruits.

One should learn how to purchase and cook the less expen cuts of meat. Meats suitable for stewing or simmering are usu the cheapest.

Choose the type of store best suited to your needs. Cash-a carry stores are usually cheapest in price, but the consumer sho consider time and energy spent in shopping. General credit delivery stores cost more but offer many conveniences which m

buying from them worth while Notice standards of cleanliness of store, goods, and salesman Buy where weights are honest, check weights occasionally to be sure that you are getting honest weight

Protein foods are usually expensive, especially if one thinks of meat as the main protein food It must be remembered that the daily food requirement can be met by serving fish, poultry, cheese, or egg dishes for the main meal Milk also yields, for the money expended, as high food value as most protein foods

Buy all products by weight when possible

Know the sizes of cans and brand names Read labels on all packages, notice weights

Buy products with little waste For example, prunes at a low price per pound may have little flesh and much stone and skin, while prunes at a higher price per pound may have much more flesh and less stone An inexpensive cut of meat may have a great deal of fat and bone which will be wasted, whereas a higher priced cut may have more edible portions to make it really less expensive than the lower priced cut

Use leftover foods Every bit of food wasted means an added amount to your food expenditure

Planning adequate meals The following suggestions may be helpful in cutting food cost to a minimum

Include plenty of carbohydrates which are relatively inexpensive

Use the specified amount of milk for children and for adults In cooking, canned or powdered milk may be substituted for some of the fresh milk Cream is a luxury, top milk may be used when cream is desired in coffee

Use dried fruit and canned or frozen fruit juices in place of fresh fruit

Use canned tomatoes and raw cabbage to supply vitamin C

Allow meat not more than once a day Make meat go further by combining it with other foods (for example, in casserole dishes) Eggs may be substituted for meat occasionally if the price is not too high

Use fortified margarine in place of butter on the table and in cooking

All fats left from the cooking of meat, with the possible exception of lamb fat can be used in making sauces, gravy, and some

baked products, as well as in frying. This saves buying lard or other fats, as well as improving the flavor of the food.

**Serving attractive meals.** In order to make the menu attractive, it is necessary to remember the following rules:

Do not repeat food of the same flavor in one meal. For example, do not serve a tomato cocktail for the first course, a tomato sauce with the meat, and a tomato salad; or a fish chowder for the soup course and fish for the main dish.

Use more than one type of foodstuff in a meal. For example, poor combinations are egg salad and custard; or potato soup, rice with cheese sauce, and cornstarch blancmange. The first contains too much protein, the second too much starch.

Some thought should be given to color combinations of foods. For example, a poor choice would be chicken with white potatoes and cauliflower; and a good choice, the same poultry with color added by sprinkling parsley on the white potatoes and choosing peas and carrots for additional vegetables.

Do not repeat the form of foods in the same meal. For example, creamed fish, mashed potatoes, and mashed squash would all be the same texture. It would be better, even if the same vegetable were used, to pan-brown the potatoes and bake the squash.

Improve the arrangement of food by adding garnishings such as slices or wedges of lemon to fish, maraschino cherries to pudding and pastry, or water cress to meats and vegetables, if they can be afforded.

Two other hints for making meals attractive are:

Serve acid foods at the beginning of a meal, as they sharpen the appetite. A well-flavored thin soup also serves as an appetizer.

*Serve hot food hot and cold food cold.*

## *SUMMARY*

Planning the purchase of several days' supply of food at one time as is recommended, requires consideration of several factors to achieve balance and variety in the nutritional requirements of the body, such as likes and dislikes, religion, finances, and customs.

Menu planning centers around three meals a day: breakfast dinner, and luncheon or supper.

Breakfast is generally the most important meal of the day, for it supplies fuel necessary after a night's fasting, arouses and stimulates the appetite, and provides energy for the morning's work

Dinner, which may come either at noon or at night, may be more or less elaborate It generally has three courses, the main course consists of meat, fish, or poultry, with vegetables

Luncheon or supper may consist of one main dish supplemented by a salad or dessert, or both

Leftover food should be utilized promptly and made into palatable dishes, generally suitable for supper or luncheon

The high cost of food stresses the desirability of economical buying without sacrifice of food values Quite a few principles have been formulated for the intelligent selection of foods for palatability, high food value, and low price

## Questions

1 Why is it economical to do the marketing for several days at one time?
2 Around what groups of food should all meals be planned? Name these groups
3 Bring to class a recipe for an attractive and wholesome casserole dish
4 Discuss each of the following factors as an influence on the cost of food (a) cost of transportation, (b) seasonal production, (c) cost of marketing, (d) supply and demand
5 Discuss the influence of the following on the cost of food (a) local sources, (b) foods in season, (c) broken versus whole pieces
6 What is the best time of day to buy perishable foods?
7 What other complete protein foods may be used in place of meat?
8 What is the best beverage for the school child?
9 Give several suggestions on how to make a meal attractive

# 19

# DIET IN DISEASE

Nutrition, as we have learned, is the study of foods as they relate to good health. *Diet therapy* is the study of treating disease by making changes in the normal diet of the patient.

In this sense, the kind and amount of food in the sick person's diet is prescribed by the physician in much the same manner as he orders medicine. But the preparation of the diet and the serving of foods to the patient are done by other people. In the hospital, the dietary department usually carries this responsibility. In the home, the practical nurse or some member of the family who has been instructed will plan and prepare the diet. But, regardless of who prepares the food, the practical nurse has the responsibility of seeing that the patient is made ready for his meal and that he eats the food. Since the way his food is prepared and served is a definite factor in tempting the patient to eat, the practical nurse must exercise both imagination and ingenuity in the food preparation and service.

A discussion of nutrients and the conditions in which they are used appears in Chapter 17, "Food: The Foundation of Good Health." Therefore, this chapter will deal only with special applications of nutrients to the therapeutic diet.

In the home, whenever possible, the family menu of the day should serve as the basis of the patient's diet. The menu may be adjusted to the patient's needs (1) by omitting some foods, (2) by adding certain foods, or (3) by varying the method of food preparation. Thus the patient will not feel that he is "different" from the

other members of his family, nor will the family be burdened with unnecessary expense in paying for special foods

Diets may be modified by changing the consistency (or bulk) of the diet, by varying the number of calories in the diet, and by varying the nutrients in the diet

In the hospital, certain diets are called *standard* or *routine*, such as liquid, soft, convalescent or light, and regular or house diet With the exception of the regular or house diet, the standard hospital diets are modified by changing their consistency or method of preparation

Liquid diet consists of only liquid foods which can be digested easily Fruit and vegetable juices should be avoided

*Clear liquid diet*

Water
Clear broth (strained), (chicken, beef, vegetable, clam)
Coffee or tea
Ginger ale

This diet is ordered after some operations, during the first days of an acute illness, and for patients with certain intestinal disorders Feedings are given frequently (every 2 or 3 hours) in small amounts However, this diet is not nutritionally adequate, as it only replaces some of the body fluids, as soon as it can be tolerated, a more liberal or full liquid diet is used

*Full liquid diet, with food in fluid form*

Clear liquids as above
Milk, cream
Eggnog
Cocoa or chocolate
Cereal gruels (strained)
Cream soups
Custard
Junket
Jell O

*Typical liquid diet of high food value*

A M 8 00 Coffee with cream and sugar
10 00 Gruel
M 12 00 Fruit Juice
P M 2 00 Malted milk
4 00 Fruit Juice or ginger ale
6 00 Cream soup
8 00 Fruit beverage
10 00 Hot milk

Water should be given between feedings

The diet above is given simply as a suggestion, not as a prescription, for feeding the patient. If a patient dislikes cream and sugar with tea or coffee, another liquid food such as milk or fruit juice should be given shortly afterwards. This is especially important at breakfast time, as black coffee has no nutritive value.

A restricted fluid diet can do little more than replace body fluids, and if continued for a prolonged period, a more liberal diet is used. The amount of energy value may be increased with foods such as lactose or corn sirup. The protein intake may be increased with dry skim milk, gelatin, and egg white and by the addition of protein powders.

The liquid diet must be supplied to the patient in the amounts he can tolerate at one time and often enough to ensure his receiving the total quantity ordered for the day. It should be planned to:

1. Supply adequate nutrition
2. Appeal to the appetite
3. Provide frequent feedings in desired amounts

Soft diet consists of liquids and semisolid foods, soft in texture and easily digested. When carefully planned and well prepared, this diet is nutritionally adequate. The cellulose in cooked fruit, vegetables, and coarse cereals is removed by straining. Meat, if allowed, is finely ground. The soft diet is used following some operations, in acute infections, in gastrointestinal conditions, and for patients who lack the strength to chew or who have lost their teeth.

*Foods usually allowed*

All liquid foods
Milk, cream, butter
Cottage and cream cheese
Cereals, well cooked
Milk or cream toast
Soft-cooked eggs
Fruits, cooked, canned, or frozen (all seeds, coarse skins, and fiber removed)
Broths, strained; cream soups
Meat jellies
Soufflés
Gelatin
Custards, junket, cereal puddings
Ice cream, sherbet, ices

*Foods sometimes allowed*

Scraped beef or lamb
Tender chicken
Fish
Sweetbreads

The schedule of feeding usually allows six or eight feedings each day

*Typical soft solid diet*

| | |
|---|---|
| Breakfast | Fruit juice<br>Cereal<br>Toast with butter<br>Coffee with cream |
| 10 00 A M | Eggnog<br>Toast or soda crackers |
| Dinner | Creamed chicken on toast<br>Lemon gelatin, cream<br>Tea, coffee, or milk |
| 3 00 P M | Cocoa and buttered toast |
| Supper | Tomato juice<br>Poached egg on toast<br>Ice cream<br>Tea or milk |
| Bedtime | Malted milk |

**Light, or convalescent, diet** This includes all easily digested foods Those of the liquid and soft diet are used with the addition of cooked vegetables and tender meats, such as steak, lamb chops, or sweetbreads, and white fish The meat or fish used should be broiled or baked instead of fried

*Typical convalescent diet*

| | |
|---|---|
| Breakfast | Orange<br>Cereal with milk<br>Toast<br>Coffee |
| 10 00 A M | Milk or eggnog or fruit beverage |
| Dinner | Soup with crackers or toast<br>Broiled halibut or chicken<br>Baked stuffed potato<br>Stewed tomatoes<br>Bread, butter<br>Tapioca pudding |

| | |
|---|---|
| 3:00 P.M.: | Milk or eggnog or fruit juice |
| Supper: | Cream potato soup, crackers<br>Peas<br>Lettuce salad<br>Bread, butter<br>Applesauce |
| Bedtime: | Milk with crackers or toast |

**Regular, or house, diet.** This is a diet used when a special diet is not necessary, as, for instance, when the patient has had an injury such as a broken leg. It is very much like the normal diet except that rich foods, such as pastries, rich cakes, and fried food are avoided.

**Low-residue, or bland, diet.** This diet, which is a modification of the normal diet, resembles the soft diet. Only nonirritating foods and those low in celullose are permitted. Vegetables and fruits may be omitted entirely, or, if allowed, must be finely ground or puréed. Foods high in acid content and fried foods, as well as irritating substances such as spices and condiments, are not given. Extremes of food temperature should be avoided. The low-residue, or bland, diet is indicated in disorders of the gastrointestinal tract, such as peptic ulcer, colitis, and diarrhea, when it is essential that easily digested, nonirritating foods be supplied. When the condition is in the acute stage, as in some ulcers, only milk, egg, and cereal are given at first, and the other foods, finely ground, are slowly added to the diet. It is important that the patient eat slowly and at regular times. The feedings are usually small and are given at regular intervals.

High-residue diet, similar to the normal diet, is planned to increase the amount of bulk and roughage eaten daily. Foods particularly good for supplying bulk are all vegetables, but especially green vegetables such as cabbage, spinach, celery, lettuce, and tomatoes. Fruits of all kinds are valuable not only for the cellulose they contain but for the fruit acids, which are laxative. Dried fruits are very good. The skins of most fruits should be eaten. Breads and cereals made of whole grains are excellent aids in overcoming certain kinds of atonic constipation.

The high-residue diet is used to stimulate peristalsis, since constipation is caused by lack of muscle tone.

In another form of constipation, known as spastic constipation, bulky foods are restricted Because of an irritated condition of the colon, the low-residue, or bland, diet is indicated

Water is valuable because it keeps the food masses in semiliquid condition Everyone, but particularly those suffering from constipation, should drink from six to eight glasses of water each day Two glasses before breakfast aid peristalsis

**High-calorie diet** The number of calories in this diet may be raised to 3,500 or 4,000 a day, according to the physician's orders The food may be of any consistency—liquid, soft, semisolid, or "regular"—with the proper balance of nutrients

The high calorie diet is used for patients whose metabolic rate is increased, as in prolonged fevers or certain glandular conditions It is also indicated for patients who are underweight or poorly nourished

**Low-calorie diet** This diet is used to reduce weight in obesity caused by eating an excessive amount of food or resulting from the body's metabolic rate being below normal The physician should prescribe the diet and "supervise" the patient while on the diet regime The diet may simply reduce the total amount of food to be eaten or restrict the sugar, starches, and fats to be consumed The daily protein, minerals, and vitamin content of the diet must be maintained at normal levels

Carbohydrates are reduced in obesity and are restricted in diabetes

**Vitamins** The chart on vitamins (pp 145–46) indicates those conditions which result when there is a marked lack of any one vitamin in the diet It also includes a list of foods which are rich in vitamin content

Vitamins in medicinal form may be prescribed by the physician when vitamin deficiency exists There is no evidence that vitamins in this form increase the well being of persons unless they have a deficiency

If the foods of the "basic seven" pattern are included in the daily diet, an adequate supply of needed vitamins is ensured But the foods must be stored and prepared properly to preserve their vitamin content

**Minerals** For the discussion of the conditions in which addi-

tional sources of calcium, phosphorus, iron, copper, and iodine are needed, see pages 137–39.

Low-sodium diets are planned to reduce the intake of foods containing sodium, which, under certain abnormal conditions, causes the tissues to retain too much fluid. The low-sodium diet is ordered for patients with hypertension, congestive heart failure, nephritis, and other conditions in which edema occurs.

As salt contains 40 per cent sodium, it is omitted both in the cooking and serving of foods allowed in these diets. Some physicians may order the fluid intake to be restricted, while others will not limit the fluids when the sodium content is restricted.

The physician will furnish complete lists of foods allowed and those to be omitted, and the nurse must be careful to follow his instructions closely.

Unsalted butter, breads made without sodium, a commercial milk product from which sodium has been removed, sodium-free condiments, and canned goods prepared without salt are available in some grocery stores and bakeries.

**Protein.** The sources and function of protein in the body have been described on pages 135–37.

Protein in the diet is increased to aid tissue growth during pregnancy, childhood, adolescence, before and after operations, and for patients with long-term illness or infectious diseases. Often a high-protein diet makes use of supplementary foods such as skim milk, brewer's yeast, and wheat germ to increase the amount of protein in the diet.

Protein is restricted in nephritis or other kidney diseases.

Fats are increased in the diet for underweight or malnutrition.

In prescribing a *low-fat diet*, the physician avoids foods prepared with extra fats, fried foods, pastries, soups, gravies and sauces, mayonnaise, cream, oil, fatty meats, and highly seasoned foods. Fats are decreased in the diet for obesity or in some disturbances of the gallbladder.

**Carbohydrates.** The normal diet includes a large amount of starches and sugars. These are increased when the body requires a high-calorie diet, as in fever and some diseases of the liver.

## *DIET IN DIABETES*

The physician prescribes the amount of protein, fat, and carbohydrates which the patient can take. The nurse has the responsibility of arranging the day's menus and weighing or measuring the food. The patient must realize the importance of keeping strictly to the diet prescribed.

The food usually ordered is plain but must be well seasoned and well cooked. Saccharin or Sucaryl is sometimes used as a substitute for sugar in sweetening beverages and in some types of desserts. Both have sweetening value many times that of sugar, but when too much is used, a bitter taste may be left in the mouth.

Since certain beverages, such as meat broths, tea, cocoa shells, and coffee without sugar and cream, have practically no food value, they may be added as extras to the diet to give variety.

Certain so-called 3 per cent vegetables contain only small amounts (1 to 3 per cent) of carbohydrates, these may be included in the diet rather freely. Other vegetables containing 6, 15, or 20 per cent carbohydrate must be used more carefully.

### VEGETABLES, FRESH OR CANNED, WITHOUT ADDED SUGAR *

Arranged according to approximate content of carbohydrate

| 3 PER CENT | | 6 PER CENT | 20 PER CENT |
|---|---|---|---|
| Lettuce | Tomatoes | Turnip | Potatoes |
| Cucumbers, raw | Radishes | Carrots | Shell beans |
| Spinach | Water cress | Okra | Lima beans |
| Asparagus | Snap beans | Pumpkin | Corn |
| Celery | Cauliflower | Onions | Boiled rice |
| Mushrooms | Cabbage | Squash | Boiled macaroni |
| Rhubarb | Egg plant | Brussels sprouts | |
| Sauerkraut | Broccoli | Beets | |
| Endive, raw | Green peppers | Green peas | |
| Swiss chard | Kohlrabi | | |
| Beet greens | Kale | | |
| Dandelions | Summer squash | | |

* For more detailed information 'Meal Planning and Exchange Lists' is available at the American Dietetic Association, 620 North Michigan Avenue, Chicago 11, Illinois.

In the table below are listed various fruits with quantities necessary to provide 10 and 15 grams of carbohydrates respectively:

## EQUIVALENTS OF 10 AND 15 GRAMS OF CARBOHYDRATE IN VARIOUS FRUITS

| FRUIT, FRESH OR CANNED (WATER-PACKED) | CARBOHYDRATE PER CENT | GRAMS REQUIRED TO YIELD CARBOHYDRATE 10 GM. | 15 GM. |
|---|---|---|---|
| Grapefruit pulp | 7 | 150 | 225 |
| Strawberries | 7 | 150 | 225 |
| Watermelon | 7 | 150 | 225 |
| Cantaloupe | 7 | 150 | 225 |
| Blackberries | 8 | 120 | 180 |
| Orange pulp | 10 | 100 | 150 |
| Pears | 11 | 90 | 135 |
| Peaches | 11 | 90 | 135 |
| Apricots | 12 | 80 | 120 |
| Raspberries | 12 | 80 | 120 |
| Plums | 12 | 80 | 120 |
| Pineapple | 14 | 70 | 105 |
| Apple | 14 | 70 | 105 |
| Blueberries | 14 | 70 | 105 |
| Cherries | 16 | 60 | 90 |
| Banana | 20 | 50 | 75 |
| Prunes (cooked) | 20 | 50 | 75 |
| Ice cream (occasional fruit substitute) | 20 | 50 | 75 |

In calculating diets, it is essential to keep in mind certain basic values such as those listed below:

1 gram of carbohydrate yields 4 calories
1 gram of protein yields 4 calories
1 gram of fat yields 9 calories
6.25 grams of protein contain 1 gram of nitrogen

1 kilogram = 2.2 pounds
30 grams (gm) or cubic centimeters (cc) = 1 ounce
A person at rest requires about 25 calories per kilogram

The carbohydrate, protein, and fat content of diets may be calculated easily by the use of approximate values such as those listed in the following table:

## CARBOHYDRATE, PROTEIN, FAT AND CALORIC VALUE OF ONE OUNCE OF CERTAIN FOODS

| 30 GRAMS (1 OZ) CONTAIN APPROXIMATELY | CARB GRAMS | PROTEIN GRAMS | FAT GRAMS | CALORIES |
|---|---|---|---|---|
| Bread, 1 large slice | 15 | 2.5 | 0 | 70 |
| Oatmeal, large portion | 20 | 5 | 2 | 118 |
| Crackers, 2 | 10 | 1 | 0 | 44 |
| Vegetables, 3% plus 6%, 4 large portions | 20 | 6 | 0 | 104 |
| Potato | 6 | 1 | 0 | 28 |
| Milk | 1.5 | 1 | 1 | 19 |
| Egg, 1 | 0 | 6 | 6 | 78 |
| Meat, lean | 0 | 7 | 5 | 73 |
| Chicken, lean | 0 | 8 | 3 | 59 |
| Fish, fat free | 0 | 6 | 0 | 24 |
| Cheese | 0 | 8 | 10 | 122 |
| Bacon | 0 | 5 | 15 | 155 |
| Cream, 20% light | 1 | 1 | 6 | 62 |
| Cream, 40% heavy | 1 | 1 | 12 | 116 |
| Butter | 0 | 0 | 25 | 225 |

## SAMPLE DAILY DIET FOR AN ADULT DIABETIC PATIENT

C 169, P 77, F 97, 1,857 calories

| FOOD | BREAKFAST | | DINNER | | SUPPER | | TOTAL |
|---|---|---|---|---|---|---|---|
| | *Grams* | *Portions* | *Grams* | *Portions* | *Grams* | *Portions* | *Grams* |
| Meat, cooked | | | 75 | 2½ oz | 75 | 2½ oz | 150 |
| Egg | | one | | | | | one |
| Bacon | 15 | 2 strips | | | | | 15 |
| 3% vegetables | | | 150 | 1 cup | 150 | 1 cup | 300 |
| 6% vegetables | | | 75 | ½ cup | 75 | ½ cup | 150 |
| Oatmeal cooked | 120 | ½ cup | | | | | 120 |
| Butter | 10 | 2 tsp | 10 | 2 tsp | 10 | 2 tsp | 30 |
| 20% cream | 60 | ¼ cup | 30 | 2 tbs | 30 | 2 tbs | 120 |
| Milk | 120 | ½ cup | | | | | 240 |
| Orange | 100 | 1 small | 150 | 1 med | 150 | 1 med | 400 |
| Potato | | | | | 90 | 1 med | 90 |
| Bread | 30 | 1 slice | 30 | 1 slice | 30 | 1 slice | 90 |

3 P M 2 soda crackers (2½ in sq)
120 grams (½ cup) milk

Bedtime 2 soda crackers

In place of oatmeal, other cooked or dry cereals may be used in appropriate amounts. (One-half cup of cooked cereal is equivalent to ¾ cup of dry, flake, or puff types.) Potato substitutes include bread, rice, shell beans, corn, and macaroni. Protein foods include meat, fowl, fish, cheese, and eggs. Margarine may be used in place of butter in exactly the same amounts.

The remarks in this section do not by any means provide complete instruction in the calculation of diets, but they may serve as a basis for such.

The sample diet on page 169 provides carbohydrate, 169 grams; protein, 77 grams; fat, 97 grams; 1,857 calories per day. This diet is given in detail merely as an example and not as one to be followed in any particular case.

## SUMMARY

Diet therapy is the study of treating disease by making changes in the normal diet of the patient. Therefore the physician prescribes diets as he would medicine. The nurse may or may not prepare the diet, but she gets the patient ready for his meal and sees that he eats it in attractive, pleasant surroundings.

In the home, the patient's meal is often an adaptation of the family meal, being modified perhaps in consistency, caloric value, or the nutrients included.

In the hospital, certain diets are regarded as standard, yet they are modified to conform to the individually prescribed diet. The most common standard diets comprise: the liquid diet (in its several varieties), the soft diet, the light or convalescent diet, and the regular or bouse diet. The high-residue diet, the high-calorie diet, the low-calorie diet, and the low-sodium diet are frequently ordered.

The doctor prescribes for the diabetic patient the amount of protein, carbohydrates, and fats. It is the responsibility of the nurse to interpret and carry out strictly these directions in serving the patient's meals. The physician may suggest the use of *Meal Planning with Exchange Lists* (see bibliography, p. 180), which suggests variety without sacrificing the essential components.

## Questions

1 What department is responsible for the preparation of diets in the hospital?
2 In what three ways may diets be modified?
3 What is meant by a standard diet? Name some standard diets
4 What is the purpose of the clear liquid diet? Is it nutritionally adequate?
5 How may the following be increased in a restricted fluid diet (a) the amount of energy value, (b) the protein intake?
6 How may fruits and vegetables be prepared suitably for a soft (liquid, semisolid) diet?
7 In disorders of what system is the low residue, or bland, diet indicated?
8 For what purpose is the high residue diet valuable?
9 To what patients is a high calorie diet given?
10 Discuss the use of vitamins in medicinal form
11 Under what abnormal conditions are low sodium diets prescribed and what foods should be included?
12 Under what conditions, for example, are (a) proteins increased, (b) proteins decreased, (c) fats increased, (d) fats decreased, (e) carbohydrates increased, and (f) carbohydrates decreased?
13 Name two substitutes for sugar used in the diabetic diet
14 Name two or three beverages which have practically no food value
15 Name several (a) 3 per cent, (b) 6 per cent, and (c) 20 per cent vegetables
16 Name five low calorie fruits
17 How many calories does 1 gm of each of the following yield (a) carbohydrate, (b) protein, and (c) fat?
18 Name several substitutes for potato

# 20

# FOOD LESSONS

We shall consider in this chapter some general facts about t
most important foods included in the normal diet, with its empha
on the "basic seven."

Milk is one of the most important foods because it is a nea
complete food, that is, one containing all the elements necessary
promote growth, to yield energy, and to give health. However, e
for babies, at any age, it should be supplemented by orange juice
ascorbic acid to provide vitamin C, and by meat and eggs to p
vide iron.

Milk contains carbohydrate, fat, complete protein, calci
phosphorus, and vitamins A and B. It also contains vitamin D
variable amounts, depending upon the amount of sunshine to wh
the animal has been exposed and whether or not the milk has b
irradiated. Milk contains only a very small amount of iron, but
iron is in a form readily used by the body.

It is not always realized that thousands of bacteria which do
harm are present in milk, but it is important to prevent the entra
of the disease-carrying bacteria, such as those causing typhoid fe
scarlet fever, tuberculosis, diphtheria, and undulant fever.

These bacteria and many others do not produce any notice
changes in the milk, and their presence can be detected only
powerful microscope.

Bacteria live and grow very rapidly in milk and gain entrance to it readily unless every precaution is taken in the handling

To drink raw milk is considered dangerous because, although all dairies and farms are inspected regularly, it is impossible to be sure that everyone engaged in the handling and production of milk is at all times clean and free from disease, that every cow is clean and free from disease, and that every dairy is absolutely clean

Some bacteria in the milk, while not disease producing, may cause changes which will render it unfit for food Souring, caused by lactic acid bacteria, does not make the milk harmful as a food

Pasteurization of milk Science has developed a process known as pasteurization, which makes the milk supply safe for consumption and at the same time maintains its nutritive value The United States Department of Agriculture recommends proper pasteurization as a safety measure and advocates the use of pasteurized milk

Pasteurization means a process of heating the milk to a temperature not lower than 142 5° F (61 4° C ) for not less than 30 minutes After the milk is pasteurized, it is immediately cooled to 50°F (10°C ) or lower

Pasteurization kills all disease producing bacteria commonly found in milk and checks the growth of many of the other bacteria Milk thus treated remains sweet longer than raw milk

Homogenization of milk is a process which breaks up the fat globules of the milk into very small particles, these smaller fat globules are evenly distributed and do not rise to the top as cream

Vitamin D fortified milk has been reinforced by the addition of a vitamin D concentrate

Care of milk Pasteurized milk needs the same care as raw milk, for, when bacteria enter, they grow just as rapidly as in raw milk It must be kept clean, cold, and covered at all times Wash the outside of the milk bottle and place it in the refrigerator as soon as it has been delivered Always wash the top of the milk bottle before pouring the milk Always use clean utensils Old milk should not be mixed with new

In every state there are laws regulating the production of milk and grading it according to certain standards of purity and cleanliness, and, in some instances, the butterfat content A label or cap on the bottle states whether the milk is raw or pasteurized

Coffee and tea. These two beverages are discussed together, as they are similar in their action and effect on the body. They have no nutritive value but are useful as stimulants and for the water they contain.

Both contain a stimulant called caffeine. Some people are not so susceptible to the effects of caffeine as others, but in many it produces sleeplessness and nervousness and increases the activities of the kidneys. Coffee and tea should be withheld if such effects are produced.

Both tea and coffee contain tannin, a bitter substance that retards digestion. Tea, because it usually contains more tannin, should not be given to people suffering from digestive disorders.

Tea and coffee should never be given to children, for they do not need the stimulating effect. These beverages take the place of more needed foods, such as milk, and dull the appetite for less highly flavored foods which are essential for the normal growth and health of the child.

When properly made, tea and coffee contain little tannin. Tea should never be boiled, for the tannin in tea is readily soluble in boiling water and becomes bitter.

Coffee should be purchased in small amounts, unless bought in the bean and ground as used, for ground coffee readily loses its flavor unless kept in an airtight container. Tea keeps its flavor and may be bought in larger quantities.

Cocoa and chocolate both contain tannin but in smaller amounts than tea or coffee. Both also contain a stimulant called theobromine, which is similar in its effects to caffeine.

Cocoa and chocolate have a high food value. They contain some protein, fat, and carbohydrate. Chocolate has a large percentage of fat and, if taken with a heavy meal, may cause indigestion. Cocoa, having less fat, may be used more freely.

Weak cocoa may sometimes be given to children. It is useful in making milk more acceptable and may be used when there are no digestive disorders.

Cocoa and chocolate both contain starch and must be boiled to make the starch digestible, but overcooking will destroy the flavor.

Postum and other cereal beverages which contain no stimulating qualities may be used as a substitute for coffee.

Cereals are made from the seeds of grains and are the oldest

foods known to mankind When properly cooked, they are one of the most easily digested foods For this reason they are used in diets for the sick

All cereals consist principally of carbohydrate, mostly in the form of starch, which is needed for energy in the body The whole grain cereals contain, in addition to the starch small amounts of other materials needed for growth and health They also contain cellulose

Cereals may be made more nourishing by adding chopped dried fruits, such as dates or raisins during the last ten minutes of cooking The use of sugar on cereal should be discouraged

When a child will not easily take the required amount of milk, it is often desirable to cook the cereal in milk, thus helping to meet the daily milk requirement Since twice as much uncooked cereal is needed to supply the same amount of energy content as is produced in cooked cereals, the latter are much less expensive The former, however, are convenient for emergencies and give variety to the menu

**Fruits** Fruits are very necessary foods in the diet Canned, frozen, dried, or fresh fruit should be served daily or, if the food allowance will permit, twice daily Fresh fruit should be served as often as possible

Fruits are valuable in our diet because

1 They are rich sources of minerals, namely, iron and calcium

2 They are rich sources of vitamin A and good sources of vitamin B

3 Fresh fruits, especially citrus fruits, contain a particularly abundant supply of vitamin C

4 They are laxative Fruits contain fruit acids and cellulose, both of which are stimulants for the bowel action

Fruits vary greatly in their energy content Dates, apples, bananas, prunes, apricots, and raisins are high in calories Grapefruit, oranges, melons, and peaches are low in calories but, because of their health value, should be included in the diet

Fresh fruits bought in season are never to be regarded as a luxury Most of the energy content in thoroughly ripe fruits is in the form of sugar Starch is often found in unripe fruits, thus making them rather difficult to digest In general, stewed fruits are easily digested

*Rules for buying fruits*

1. Buy fruits in season; they are cheaper and have a better flavor.
2. Buy sound, ripe fruit.
3. Buy in as large a quantity as possible, but do not buy when there will be a waste from spoilage.
4. Buy by weight whenever possible.

Vegetables are necessary foods in the daily diet. Two vegetables should be served every day, and a raw vegetable at least two or three times a week.

Vegetables are important as a food because:

1. They are rich sources of minerals.
2. They are rich sources of the vitamins A, B, and C. As vitamin C is found chiefly in fresh vegetables and fresh fruit, a raw vegetable once a day will ensure a sufficient supply of this vitamin.
3. They are laxative. Nearly all vegetables contain some cellulose, which aids in preventing constipation.

*Rules for buying vegetables*

1. Buy vegetables in season; they are cheaper and fresher and have a better flavor.
2. Buy young, fresh vegetables; they have a better flavor and contain more vitamin C.
3. Buy sound products that are ripe but firm. Specks, spots, and bruises mean inferior quality. Leafy vegetables should be fresh and crisp; cabbage and lettuce should be firm.
4. Buy vegetables of medium size and fairly regular shape. Small-sized products tend to be wasteful, and large ones are often of poor flavor.
5. Buy only the amount of summer vegetables which you can use quickly. They spoil and lose their flavor.
6. Buy winter vegetables in large quantities if there is cool, dry storage space available. They will not keep long in warm, damp places.
7. Buy frozen vegetables and use them immediately, unless they are stored in the *freezing* compartment of an electric or gas refrigerator or in a deep freeze.

Meat. Since meat is an expensive food, most families will not wish to waste it, either by eating more of it than is required for health or by failing to store and prepare it intelligently. Most people eat more meat than they need. When meat is eaten to the exclusion of fruits and vegetables, it reduces the amount of vitamins and minerals supplied to a level below the standard of safety.

Meat once a day is desirable, although not absolutely necessary if another complete protein (animal) food, such as milk, eggs, or fish, is substituted

Meat should be covered loosely with waxed paper and stored in the coldest part of the refrigerator or in a deep freeze if one is available Although cooked meat will keep better than raw, it should be kept at a low temperature and used in leftover dishes as soon as possible

METHOD OF COOKING MEAT Meat may be cooked using either dry or moist heat Roasting, broiling, and pan broiling are the three ways to use dry heat, while braising, cooking in liquid, and stewing are the methods used with moist heat

Always cook meats at a low temperature, since a high degree of heat toughens the protein fibers and shrinks the meat

*Dry heat methods Roasting* Large pieces of beef, leg of veal or lamb, and loin of pork are generally cooked fat side up on a trivet in a shallow roasting pan No water is added Since the heat will circulate around the meat, the pan should not be covered The temperature should be 300°F (149°C) for all meats except pork, which requires 350°F (177°C) The time depends upon the size and the weight of the piece Most cookbooks contain charts showing the time to be allowed for proper roasting A low temperature is always to be preferred to a high one

*Broiling, pan broiling* Broiling is done under direct heat Pan-broiling is done over direct heat, in a hot, uncovered, heavy frying pan, with the fat being poured off as it accumulates so that the meat does not really fry Porterhouse or sirloin steak, chops, ham steak, and bacon are preferably broiled, but chops may very well be pan broiled

*Moist heat methods Braising* When meat is braised, it is browned in a small amount of fat before it is cooked in liquid Braising is economical, since less tender and less expensive cuts can be made appetizing by being braised Cooking in liquid prevents the meat from becoming hard and dry while being cooked

A small amount of fat is heated in a heavy frying pan The meat is often dredged all over with flour to make it a deeper brown when it is being seared on all sides in the fat A small amount of liquid—water, soup stock, tomato juice, sour cream, or liquids from cooked vegetables—is then added A trivet is placed under the meat to pre

vent its sticking. The pan is tightly covered to retain the steam. The meat should be cooked until it is tender, the time depending on the size and cut. The liquor is boiled down to improve its flavor. The temperature should be 300°F. (149°C.).

Vegetables may be added toward the end of the cooking period. They should be cooked only until tender.

*Cooking in liquid.* When meat is cooked in liquid, it should be simmered rather than boiled, to develop a finer flavor. Corned beef and ham are frequently cooked this way.

Stewing should be done below the boiling point. The large cuts —chuck, rump, round, or shin—are good choices for stewing. The meat should be cut into small pieces to which may be added, near the end of the cooking period, such vegetables as carrots, potato, onion, celery, or green pepper. The pieces should be fairly uniform in size. Vegetables which require about the same length of time to cook should be selected.

Fish spoils rapidly; it must therefore be fresh when purchased. For this reason, one should buy fish from a reliable dealer. The flesh should be firm and should have no disagreeable odor. As soon as the fish reaches the house, it should be placed in the refrigerator.

If frozen fish is purchased, it must be used immediately after thawing, for frozen products spoil much more quickly than fresh ones. Fresh fish has better flavor than frozen fish.

Salt fish, with the exception of salt cod, is more difficult to digest than fresh fish. If salt cod is carefully prepared, it is a very economical food.

Oysters are in season from September through April. They should be purchased alive if possible. Oysters and clams are both much used for sick people. Oysters are very easily digested and can be served when other foods cannot be taken. The soft part of the oyster is very readily digested; the tough muscle is more difficult and should he removed before serving if there is any digestive disturbance. Clam broth and oyster broth are particularly valuable as stimulants to digestion.

Methods of cooking fish. The same methods of cooking as are used for meat may be adapted to the cooking of fish. Baking fish is equivalent to roasting meat. Fish should be cooked only until it is tender.

## *SUMMARY*

This chapter is concerned with some general facts about the most important foods included in the "basic seven" groups: milk and other beverages, cereals, fruits, vegetables, meat, and fish.

Milk, although one of the most valuable foods, is not complete nutritionally. It requires exceptional care, even after pasteurization, to keep it fit as food.

Coffee and tea have no nutritive value; cocoa and chocolate have a high food value. All four contain a stimulant: caffeine, tannin, and/or theobromine, the presence of the stimulant accounting for the popularity of the drink. Whether or not they are beneficial depends on their effect on the individual.

Cereals are the easily digested seeds of grains. They can be combined with milk and fruits to enrich them and make them more palatable.

Fruits and vegetables should be served often, for they are rich sources of minerals and vitamins. They vary widely in energy content. Fruit acids are laxative, and the cellulose fruits and vegetables contain provides roughage. Frozen fruits and vegetables should be stored in a *freezing* compartment unless they are to be used at once.

Meat or fish once a day is desirable. They may be cooked by either dry or moist heat, using methods to retain their values and preserve their flavors. Low-cost cuts of meat can be made tender and palatable by long, slow cooking with moist heat. Fish should be cooked only until tender. Until ready for cooking, both meat and fish should be stored at very low temperatures.

### Questions

1. What are the chief nutrients in milk?
2. With what should milk be supplemented to provide: (1) vitamin C, (2) iron?
3. Name three or four diseases which may be caused by certain bacteria in milk.
4. Tell what you can about the pasteurization of milk.
5. What is meant by homogenization?
6. Discuss the proper care of milk in the home.

7. Are some persons justified in saying that they should not drink coffee? Should children drink tea or coffee?
8. Why are cereals of value in diets of most patients?
9. Name specific vitamins and minerals found in fruits.
10. Give three good rules to apply in buying fruits.
11. What are the disadvantages of eating more meat than is required?
12. Name some methods of cooking meat by dry and by moist heat.
13. If vegetables are to be added to meat being braised, when should they be placed in the liquid?
14. How can you judge whether or not fish is fresh?
15. How do you think frozen foods compare with (a) fresh and (b) canned foods?

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# PART IV

## *The Practical Nurse and Her Patient's Environment*

# 21

# THE PATIENT'S ENVIRONMENT

The patient's environment must be considered in promoting his well being The nurse has the responsibility of making the conditions in his room as healthful as possible Every home is different from every other one, but a knowledge of those essentials which make for a cheerful atmosphere and wholesome, comfortable surroundings will enable the practical nurse not only to make the best of any situation but to improve the environment during her service in the patient's home She should be aware that the factors which produce a good environment from a hygienic and psychological standpoint include adequate ventilation, proper temperature, sunlight and well placed artificial illumination, quiet and privacy, good taste in furnishings and furniture, freedom from unpleasant sights and odors as a result of sanitation, cleanliness, and good order

## *VENTILATION*

"Ventilation" is a word derived from the Latin *ventilare,* meaning "to fan " This word, in turn, was derived from *ventus,* meaning "the wind " It is the process of supplying the necessary quantity of fresh air to rooms and buildings We must know something about ventilation, as a plentiful supply of fresh air is essential to health and aids in fighting disease

air is not so important as lack of movement, excess moisture, and too high temperature.

Human beings give off organic matter as they breathe and perspire, and the odor is often offensive. The increase in temperature and moisture causes the pulse to rise, respiration to increase, headache, and, if too long continued, dizziness and nausea. When a person lives in bad air over a period of time, he loses appetite, may become anemic, and is more susceptible to disease.

Natural ventilation is provided by cracks, crevices, and air spaces in the walls of our houses. No house is completely airtight, and air is constantly coming in from outside. The amount depends on the difference between the indoor and outdoor temperature, on the force of the wind, on the construction of the house, and on the material of which it is built. All this is more or less beyond our control, but we can secure good ventilation by properly opening windows, doors, and transoms.

Mechanical ventilation or air conditioning is installed in many hospitals and apartment houses. Air is drawn in from the outside, warmed or cooled, kept moving, given proper moisture, odors are removed, and air is forced through the building.

Some simple methods of ventilation in the home. Let us consider a few simple ways to ventilate the sickroom. A room is properly ventilated when fresh air is constantly entering and used air is constantly going out. This can be accomplished only when the window is always open at both top and bottom. In cold weather only a very small opening is necessary. When the windows are closed most of the time and opened only occasionally to change the air, the room is not properly ventilated.

The fresh air is colder than the indoor air; thus, when it enters the lower part of the window, it sinks to the floor; as it becomes warm, it rises and goes out at the top opening.

An open fire helps to ventilate a room because, as the flue becomes warm, it sucks up air from the room, thus creating a vacuum which the cold air rushes in to fill. Even when no fire is burning, the chimney helps to ventilate the room as the wind blows across the top of the chimney and draws up the air.

An electric fan is useful in keeping the air moving, but care should be taken not to let the current of air blow directly on the patient.

When it is not possible to open windows in the sickroom, an adjoining room can be well aired, and the door of the sickroom kept open. The sickroom will be better ventilated if the window is kept open in the adjoining room.

Opening and shutting a door will cause the air to move. This action can be repeated frequently, especially in summer.

There are many different kinds of window ventilators on the market, but substitutes can be improvised. A board about 8 inches high can be placed under and slightly in front of the lower sash. The sash should not be raised higher than the top of the board. This deflects the incoming air so that it does not fall directly on the floor, or holes can be drilled in the board and the sash allowed to rest directly on top of the board. When more air is desired, you can tack cotton cloth on the frame of a screen and place it in the window. This allows the sash to be raised the whole height of the screen.

Always remember that the patient must be screened from drafts, especially when he is sitting up in a chair. If no screen is available, a clothes rack can be draped with a blanket and placed between the window and the patient. Chairs or any piece of furniture sufficiently high can be used to take the place of a screen, or the bed can be moved to a different position.

## *SUNLIGHT*

The value of sunlight to all of us is generally recognized, but the patient who cannot get out of doors needs its healing and cheering rays even more than the well person does. Besides, the spread of infection can be prevented owing to the power of direct sunlight to kill bacteria. This property is due to the ultra violet rays in the sunlight, which are, however, filtered out by ordinary window glass.

Sun porches, sun roofs, and carefully controlled sun baths all increase the possible benefits to be derived from this source. Sometimes it is possible to roll the patient's bed out onto a sun porch or to take him in his wheel chair to the sun roof.

The patient's room should be flooded with sunlight at least part of every day, but the rays should not shine directly in his eyes, and he should have his bed or chair turned to avoid annoying glare.

Pure air is free from dust, dirt, and harmful gases. It is difficult to keep the air in our houses as pure as the outside air, since there is an accumulation of impurities from combustion, respiration, and perspiration. The nurse, being conscious of this fact, should try to keep this accumulation as low as possible by dilution, that is, by bringing into the sick room a constant supply of fresh air to replace an equal portion of the contaminated air.

Movement means air in motion. When the air is moving, it is more likely to reach all parts of the room. When the door and windows are exactly opposite each other, a draft of air blows directly through without reaching other parts of the room unless some method, such as fanning the air, is used to promote diffusion.

When there is cross ventilation, that is, windows on at least two sides of the room and not directly opposite each other, the air will have more chance to reach the corners of the room. If the room is well ventilated, the air is in motion without creating a noticeable draft.

Temperature. Most houses are overheated. The proper temperature during the day is 68°F. to 70°F. (20° to 21.1°C.). At night the temperature should be much lower. It should be remembered, however, that a higher temperature may be necessary for very old people, newborn babies, and some patients with lowered resistance or with certain respiratory diseases.

In the sickroom a thermometer should be placed where it will give the real temperature of the room. It will not do this if it is near doors or windows, the radiator, or a fireplace. Cold air is heavier than hot air and sinks to the floor. As air is heated, it expands and rises, seeking an outlet. This fact is the principle on which ventilation is based.

Variability means changes in temperature. The body is stimulated by adjusting itself to various degrees of temperature, but too great a change puts too much work on the heat-regulating system of the body. The temperature should be changed a few degrees frequently; this can be done by opening a window for a few minutes.

Humidity means the amount of moisture in the air. Moisture in the air comes from animals and human beings, from plants and trees, from the soil, from bodies of water, and from combustion. Air containing between 50 and 70 per cent moisture is comfortable. Hot air contains much more moisture than cold air. Excessive

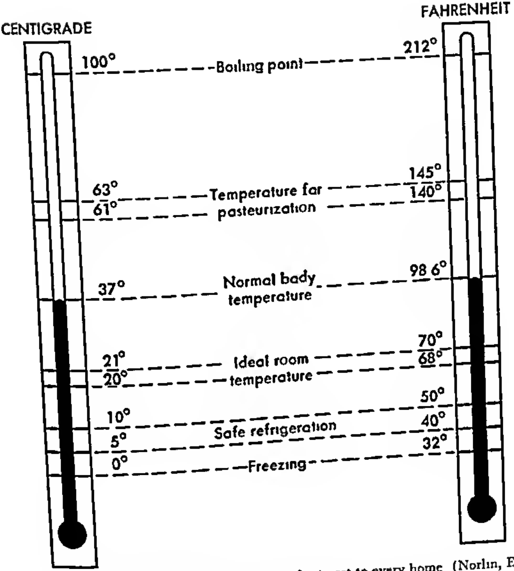


FIG 32 Temperatures that should be of interest to every home (Norlin, Eli nor E, and Donaldson Bessie M *Everyday Nursing for the Everyday Home* The Macmillan Company, New York, 1942)

humidity causes discomfort because evaporation cannot take place, and the body becomes too warm When the air is too dry, evaporation is too rapid and the body becomes chilled In winter, when the air inside is hot and dry, a pan of water can be placed on or behind the radiator Some homes are equipped with electrical humidifiers

**Effects of bad air** In a crowded room where the air is unchanged, there is loss of oxygen and increase of carbon dioxide, moisture, and temperature The increase of carbon dioxide in the

Window shades and awnings should be carefully adjusted for his comfort.

To read or work requires an adequate amount of illumination. It is better for the patient to enjoy natural daylight as long as the shadows do not fall on his book or work. When the daylight is insufficient, lamps, properly placed and shaded, will afford the proper degree of illumination.

When the patient needs to be quiet, as he does after some operations, when his eyes are weak, or just before he sleeps, his room should be darkened.

## CLEANLINESS

Cleanliness in the sickroom is of the utmost importance. The purer the atmosphere is kept, the better. Therefore, dust must not be allowed to accumulate, nor be scattered by careless dusting or sweeping. Bedding should not be shaken in the patient's room. In a clean room bacteria do not find favorable conditions for growth. The sources of unpleasant and offensive odors are immediately eliminated.

In such an environment, the patient has a feeling of comfort, protection, and well-being.

Even though in the hospital the chief responsibility for cleanliness is delegated to the housekeeping, laundry, and engineering departments, the nurse is always held accountable for the cleanliness and tidiness of the immediate environment of her patient.

Cleaning should be done at the proper time, and in a quiet, orderly, and efficient manner. Any worker can show consideration by working silently, unobtrusively, and harmoniously, when others are around. Doors, windows, and drawers will be closed softly. She will use cleaning agents which are odorless and, whenever possible, equipment which is noiseless.

### DISPO... ASTES

...lates in the home and hospital may be ... and garbage. All should be disposed of ...ulations.

Sewage. The wastes disposed of in the plumbing system are composed of bodily excretions, toilet paper, and soiled water from the kitchen, laundry, and baths Other wastes, such as matches, safety pins, hair, bottle caps, tufts of absorbent cotton, and sanitary napkins should never be thrown into the toilet or hospital hopper Grease from cooking liquors will clog the kitchen pipes as it hardens and gathers in the trap Obstructions in any part of the plumbing system are expensive to remove and cause much inconvenience while the system is "out of order" If a faucet is dripping or if any kitchen or bathroom fixture is not working right, the fact should be immediately reported to the person responsible for repairs

Rubbish generally consists of ashes, papers, magazines, old clothing, and discarded household articles These wastes should be gathered from all rooms and promptly started on the way to final disposal It is impossible to keep a house clean and in good order if rubbish is allowed to accumulate The nurse can make her work easier if she will cooperate in clearing out the trash

In the hospital, special metal containers are provided for rubbish

In the home, the nurse has the definite responsibility of taking care of the rubbish from the patient's room, such as soiled dressings from wounds, used sputum cups, paper napkins, and tissues

Paper bags can be pinned to the mattress for the patient's used tissues, as this prevents a second handling by the nurse or patient

The top of the bag should be twisted to keep the contents from spilling and the bag should be placed in a covered metal container in which it can be taken to be burned in the fireplace, stove, furnace, or incinerator In the country it is often possible to have a special place out of doors where such refuse may be burned When such a place is not available, the paper bags or soiled dressings should be wrapped in several layers of newspaper, tied securely with string, and placed in a covered waste can to be collected by the municipal sanitary department

Discarded flowers or plants, paper wrappings, and sweepings should be wrapped in newspaper before they are thrown in the container

Garbage consists of food wastes In most communities regulations govern its disposal, and provision is made for its collection The practical nurse is concerned with garbage disposal because such

wastes are unsightly, attract flies, encourage the growth of micro-organisms, and have an unpleasant odor.

Since garbage should be drained before it is put in the garbage can, uneaten food should be scraped from the dishes into a sink drainer. This container should be emptied after each meal into the garbage can, which should be lined with either strong brown paper bags or special moisture-proof liners.

The garbage can should be emptied every day and washed in hot, soapy water, dried, sunned, and aired at least once a week.

In localities where no collection is made, garbage may be buried on plowed land or burned in an incinerator.

If an electric garbage disposal unit has been installed, the nurse should follow the manufacturer's directions.

## CONTROL OF PESTS

Mankind has learned that he must wage continual warfare against pests if he hopes to survive. The chief pests to be eradicated in the home and hospital are flies, mosquitoes, fleas, bedbugs, cockroaches, rats, and mice.

In hospitals the control of pests such as the last three is usually done by a commercial company which can operate on a large scale.

Since visitors may bring lice, fleas, or bedbugs into a hospital on their clothes, or patients may arrive with such vermin, the nurse should be on the lookout and take the responsibility of reporting the first sign of their appearance. It is a mistake to think that vermin appear only on the bodies or in the houses of people who do not observe proper hygiene. They may be picked up in crowded places or brought into our houses in various ways, such as in laundry or market baskets. Prompt action should be taken whenever any of these pests are noticed.

We know that flies are a menace to health. They breed in manure and other organic wastes. The germs and dirt carried on their legs are transferred to any material with which they come in contact. Therefore, the nurse must be alert to keep flies out of the sickroom and away from food.

All windows and doors of the living quarters should be well screened. Any torn screen should be mended at once. It is important

to kill all flies and mosquitoes as soon as they enter the house and to keep the surroundings clean and protected

Cockroaches contaminate food and utensils They may be controlled by sprinkling certain powders around pipes and other places where they collect

Various poisons are available for the destruction of rats and mice, but great care should be taken that children or animals do not come in contact with such materials

It is safer for the family to call a commercial exterminating company which will furnish trained men to handle this problem

## *SUMMARY*

The patient's environment is a place where he is given the best possible conditions from both a hygienic and a psychological point of view

Ventilation is the process of supplying a plentiful amount of fresh air in movement, at a variety of temperatures, meanwhile constantly diluting the more or less bad air in the room Ventilation may be either natural or mechanical, but drafts should be avoided The accumulation of dust should be kept at a minimum, and it should not be scattered by unscientific methods of sweeping and dusting

Sunlight is of great benefit to the patient, although his eyes should be protected from the direct rays of the sun He will enjoy natural illumination, but when daylight fades, good artificial lighting will enhance his comfort

In a clean room a patient feels protected and well cared for Tidiness and order contribute to his peace of mind When his room is cleaned he should be disturbed as little as possible, and the cleaning should be done in a quiet, deft fashion

Each kind of waste from the patient's room is properly disposed of—promptly and efficiently—in the plumbing pipes, the trash can or incinerator, or garbage container Waste containers should be cleaned frequently Paper bags pinned to the mattress make it unnecessary to rehandle contaminated waste, such as soiled dressings and tissues

Pest control may be a constant battle, but when the problem be-

comes serious it is wise to employ the services of a professional exterminator.

## Questions

1. How may good ventilation be obtained in the patient's environment?
2. How can cross ventilation be obtained?
3. Why is excessive humidity disagreeable?
4. What patients are likely to need a higher temperature than others?
5. Discuss the reasons for air in the patient's room becoming bad.
6. What is the effect of an open fire upon ventilation?
7. Discuss the benefits to be derived from sunlight.
8. What is the effect of glare?
9. When is it well to darken a patient's room?
10. What wastes should be disposed of in the plumbing?
11. What device may be used to collect soiled tissues?
12. How is garbage disposed of?
13. Discuss the care of the garbage container.
14. Name some of the chief animal and insect pests which may invade the home.
15. Why are flies regarded as a menace to health?
16. What would you advise the family of a patient to do if you found the home infested with cockroaches?

# 22

# THE CARE OF THE HOME IN SICKNESS

Although it is nearly every woman's pride that she knows how to keep house, the practical nurse is engaged primarily to take care of the sick. Common sense and a feeling of good will should indicate how much she will "take hold" in the home. If the mother cannot get around or if the home is motherless, the nurse will feel that she must do the best she can to keep the house shipshape. She may take over some duties, such as listing and putting up the laundry, or checking it when it comes home. She might put a cupboard in order, do part or all of the marketing, or show in any way that she is willing to cooperate. Of course she should build her day's routine around the needs of her patient, for he is her first responsibility. Often his peace of mind is increased if he feels that the household is being held together comfortably and smoothly during his illness.

Good housekeeping has a direct effect on the happiness, health, and well being of a family.

When a good routine is established and one has learned to do the work efficiently and thoroughly, it will be found that most of the household duties can be completed in the morning, thereby leaving the afternoon free for recreation.

In doing your work, keep in mind the old proverb, "Use your head to save your heels." Many persons waste time and energy by

rushing aimlessly about, with no clear plan in their minds of what they are trying to accomplish.

It is well to make a plan of the week's routine, showing what must be done each day. A brief review of this plan every evening will help to make the next day's work smoother.

## *ROUTINE IN HOUSEKEEPING*

Whenever it happens that the practical nurse undertakes to do either housework or cooking, she will be glad that she knows what should be done and how to do it. Therefore the daily routine is presented briefly here. Of course, when the nurse is caring for the patient and also is taking some care of the house, she cannot follow any routine, except in a general way, and she would not be expected in any situation to do more than to keep the house in reasonably good order and to prepare the meals when necessary.

### A DAY'S ROUTINE

Usually cook the breakfast, as the first duty in any home.

After breakfast, clear the table, scrape the dishes, and put the cooking utensils to soak.

Then make the beds, which should have been stripped by their occupants. Give the bathroom its daily cleaning.

Air, mop, and dust the other rooms.

On returning to the kitchen wash the cooking utensils and the breakfast dishes.

Do any special task laid out for the day, such as marketing.

Prepare the midday meal and set the table. Serve the meal. Wash the dishes.

Clear up the kitchen and make early preparations for the evening meal.

Take a few hours off, getting out of doors.

Prepare the evening meal, set the table, and serve the meal. Clear the table and wash the dishes.

Before going to bed see that everything is orderly, air the living room, and make any breakfast preparations that you think are best.

## THE WEEK'S ROUTINE

The weekly washing (or sending out the laundry) and marketing are each usually scheduled for the same day every week Cleaning the bedrooms is a special job for one day each week, while cleaning the living rooms occupies part of another day Sunday, as much as possible, should be a day of rest Extra cooking is usually done on Saturday, and the kitchen is given special cleaning so that little need be done to it over the week end

Although the practical nurse does not often have the responsibility for this schedule, she can be cooperative in adapting her activities to it and by being generally helpful

How the children can help If the nurse has the responsibility for training and supervising the children in the home, she may see that it is well to let them carry out certain household duties, both as a matter of instruction and to keep them busy and happy If they have not been in the habit of doing anything, she might not feel free to suggest a change They can perform such tasks as dusting, setting the table, and washing and wiping the dishes They should be taught how to do their work well so that they may get the satisfaction of good performance

## GOOD WORK HABITS

In doing housework, certain habits of neatness, cleanliness, and efficiency may be formed to help in accomplishing the work easily and quickly, thus giving the housekeeper more time for recreation

Before we consider work habits, let us consider a few personal habits

1 Wear a neat, clean washable dress
2 Jewelry should not be worn in the kitchen
3 Cover your hair with a net, especially while you are working with food
4 Be particular about washing your hands
   Before you start to cook
   After using your handkerchief
   After touching your hair
5 When tasting food use one spoon to lift the food from the container and taste it with another spoon Never put a spoon which has been in your mouth into food you intend to serve

The following are a few suggestions for forming good work habits:

1. Use your mind to make your work easier. Plan to save steps. Keep an extra wastebasket in a convenient place to deposit things that are to go to other areas.

2 Finish one job before beginning another. Give your work a "finished" appearance.

3. Decide upon a suitable place for everything. When in a strange house notice, as soon as you can, where utensils are kept. See that the articles which you have used are put back where they belong.

4. Use a tray to hold all soiled working equipment.

5. Use newspapers to protect the table when you are preparing vegetables or arranging flowers.

6. Put dishes to soak as soon as you have finished using them.

7. Use waxed paper for lining cooking tins. Parchment and foil have many uses in the kitchen. Tissue paper, paper napkins, and paper toweling should be kept on hand to save laundry.

8. Save paper bags to hold anything which can be thrown in the waste basket.

## *HOUSEKEEPING METHODS*

Sweeping. It is preferable to use either a vacuum cleaner or carpet sweeper in the sickroom, to reduce dust to a minimum. If a broom or brush is used, sweep toward a doorway and away from the bed of the sick person. See that there is no uncovered food in the room. This also applies, of course, to a dining room or kitchen. Never sweep a sickroom just before mealtime. Scatter rugs should be removed from the floor for the weekly cleaning and brushed outdoors when possible.

1. When you sweep with a broom, use a short stroke and keep the broom close to the floor to prevent raising dust.

2. It is easier to use a short-handled brush to remove dust from corners or under furniture. A long-handled dustpan is a great backsaver.

3. When all the dust is gathered into one spot, take it up with a small brush and dustpan. Wrap sweepings from a sickroom in paper and burn.

4. After using a broom, dry mop, or brush, always shake it outdoors, pick out lint, and turn brush-side-up when put away.

5 A carpet sweeper should be emptied each time it is used, and the lint removed from the brushes The bag of a vacuum cleaner should also be emptied after use Many of the latest models have disposable paper bags that are discarded when nearly full of dust and debris

## Dusting

1 After the room is carefully swept or dry mopped, let the dust settle before dusting the furniture

2 Use a soft cloth *slightly* dampened with oil or furniture polish Shake out the dusting cloth several times during the dusting period

3 Dust high articles first, then lower ones

4 Begin at one place and go regularly around the room

5 Gather and fold dust into cloth

6 Wash out cloth and hang up after using

It is not necessary in sweeping or cleaning a room to have it in confusion Dust or sweep one part at a time, replacing articles or furniture Then, if you are interrupted, the room will not have a disorderly appearance

## Care of the floor

1 Hardwood floors should not be washed Go over them with a slightly damp cloth to remove the dust and then polish

2 In washing linoleum, use as little water as possible with a mild soap, and wipe dry Linoleum lasts longer if it is waxed once a week

3 In washing tile floors use hot soapy water

4 Wash the floor first with a wet mop

5 Rinse floor well with a mop which has been wrung as dry as possible

6 Change the water frequently, as dirty water never cleans anything

7 Wash out mop when finished and hang it out of doors

8 Wash pail, rinse, *wipe dry*, and put away

## Care of the bathroom

1 Each person should wash the tub and washbowl after using them, separate cloths should be kept in the bathroom for this purpose Wash the tub and washbowl with a cleansing powder and soft brush If any of the porcelain surfaces in the bathroom are badly stained, they can be cleaned with ammonia and water

2. Use a long-handled brush to clean the toilet.
3. Wash and wipe nickel fixtures daily. Use metal polish once a week.
4. Wash the soap dish and other small articles or fixtures.
5. Wash the floor once a week, or more often if necessary for good sanitation.
6. Clean the mirrors as needed.

## CARE OF THE KITCHEN

### Dishwashing

1. *Stacking dishes.* All dishes of one kind should be stacked together, such as glasses, silver, cups, saucers, and plates. Before stacking, scrape or rinse all dishes clean, using a rubber scraper or vegetable brush. (Soft tissue paper, paper toweling, or paper napkins may be used for this purpose.)
2. *Soaking dishes.* All dishes which need soaking, such as saucepans and baking dishes, should be filled with water directly after using. Dishes which have been used for milk, eggs, and starchy mixtures should be soaked in cold water. Those used for sugary, gelatinous, or greasy substances should be soaked in hot water.
3. *Washing dishes.* Fill dishpan with hot soapy water, and place dish drainer at either the right or left. The usual order for washing dishes is glasses, silver, china, and finally the cooking dishes. This order may be reversed by washing cooking dishes first to get them out of the way. Change soapy water frequently. Place dishes in drainer and rinse well with hot water. (A spray attached to hot-water faucet facilitates rinsing.) Use mild soap in washing fine china. Wipe with clean dish towels and return dishes to proper place.

Care of dishcloths and towels. Wash dishcloths and towels thoroughly after each meal. Rinse twice in clear, hot water. Dry out of doors when possible. Once a week, after washing them thoroughly, boil them for ten minutes, rinse well, and dry. Fold and put away all towels not in use. Hang those in use neatly on the rack.

Care of the sink. After washing dishes, clean every part of the sink with hot soapy water. All seams and corners need special care. Wipe carefully any wood- or stonework above and around the sink. Avoid using a coarse cleaning powder or strong soap on a porcelain sink.

Care of brass. Once a week, brass should be rubbed with some good metal polish and polished with a soft cloth

Care of silver. Once a week, silver should be rubbed with a good silver polish and polished with a soft cloth Then it should be washed in hot soapy water, rinsed with clear hot water, and wiped dry A jar of silver polish should be kept near the sink and used whenever a stain, such as that left by eggs, appears on the silver

Care of gas and electric stoves. Turn off all switches before starting to clean the electric range Wipe off stove with a damp cloth after each meal If stove is greasy, wash with hot water and soap Always wipe dry to avoid rusting A coal stove should be polished once a week Before cleaning a hot enameled surface, allow it to cool, to avoid cracking and chipping Before cleaning a gas or electric oven, put one-half cup of ammonia to a cup of water in a bowl and place it in closed oven overnight This will soften the grease and make cleaning easier

### Care of refrigerator

1 *Daily* Go over the refrigerator and plan for the use of any left-over foods Remove food which is spoiling If by accident any food is spilled in the refrigerator, wipe it up immediately Open the refrigerator door only when necessary, in order to save ice or electric current

2 *Weekly* (*a*) Remove all food (*b*) Scrub shelves and inside of refrigerator with hot soapy water or 2 tablespoons of baking or washing soda added to hot water Rinse well with clear water Wipe dry (*c*) When thoroughly dry, replace racks and food Wipe all food dishes on the outside (*d*) An electric or gas refrigerator should be defrosted whenever ⅛ to ¼ inch of frost forms on the unit In winter, once a week is usually often enough, in summer, it may be necessary to defrost every few days, some electric refrigerators will defrost automatically The ice cubes should be removed from the trays and fresh water put in to prevent the absorption of disagreeable flavors When the door to a refrigerator is opened frequently, frost forms more quickly In an ice refrigerator, remove ice and drainpipe, wash out ice compartment and scald drainpipe

3 *Putting the food away* (*a*) Never put hot food in the refrigerator (*b*) All foods should be tightly covered (1) to prevent food from giving off or absorbing odors, (2) to prevent food from drying, (3) to prevent unit from frosting quickly Meat, butter, eggs, and milk, which absorb odors easily and spoil readily, should be kept in the

coldest part of the refrigerator and away from foods with strong odors. Do not put food in the ice compartment. Use dishes appropriate in size to the amount of food. Dishes that are used on the table should never be used to store food in the refrigerator. Artistic food containers designed to save space are available. Use tall dishes, which take up less room than large, flat ones. In many refrigerators there is a separate unit where frozen foods may be kept.

Care of the breadbox. Old bread should not be allowed to collect in the box but should be kept in an open container to dry for crumbs. Once a week in winter and twice a week in summer, wash box with hot soapy water, scald with clear boiling water, and dry, if possible, in sunlight. Replace bread when box is dry.

Care of electric appliances. Electric appliances give better service and last longer when they have proper care:

1. Take out the plug at the receptacle end first, then remove it from the appliance. Instead of pulling at the cord, which may disconnect the wires, take hold of the plug when detaching it.
2. Handle all electric equipment with dry hands to prevent shock.
3. Never allow water to get on the appliances or on the cord attached to an appliance, as it will blow out the fuse and cause a short circuit.
4. Never put an electric appliance, such as a percolator, waffle iron, or grill in the dishpan. They should be wiped inside and out with a damp cloth.
5. A small, soft brush is useful for removing crumbs from an electric toaster.
6. Do not allow an iron to get red hot, as overheating destroys the electrical element.
7. Be careful not to overload an outlet by putting too many appliances into it. Electric wiring should be properly installed and kept in repair at all times. Avoid broken or exposed wires and faulty switches. The proper member of the household should be notified of defective equipment that has caused a fuse to burn out, so that repairs or replacement may be made before such equipment is needed again.

Care of the electric washing machine. The nurse should study the instructions before trying to operate a machine with which she is not familiar. If she has any difficulty, she can ask advice from a local electrical appliance dealer. After use, the inside of the tub should be washed and dried. If the washer is not automatic, the rolls of the wringer should be loosened to avoid tension, and the cover

replaced, somewhat ajar, so that the tub may be aired The machine should never be overloaded Care should be taken not to catch either hands or clothes in the wringer The cord should never be handled with wet hands

## METHODS OF STAIN REMOVAL

Stains should be removed from all linen before laundering The following rules may be helpful for reference

Removal of stains from white cotton or linen. If you do not know what has caused the stain, soak the material in cold water Then wash it in warm soapy water

If the stain is not removed by this process, soak in a mild bleach solution until the stain disappears, then rinse thoroughly Bleach solution can be used for the removal of stains from white cotton and linen fabrics only It cannot be used on silk, rayon, nylon, or woolen materials If fabrics are left too long in contact with any bleach, they become weakened

*Removal of special stains from cottons or linens*

ARGYROL Remove fresh stains by adding salt and ammonia to the water An old stain should be soaked in a 5 per cent solution of these ingredients

BLOOD Soak stain in cold water or lukewarm water until it is light brown in color Wash in soap and water If a stain is resistant, soak in water in which 2 tablespoons of ammonia have been added to every gallon of water, or soak in a weak bleach solution Wash thoroughly

COCOA AND CHOCOLATE Wash stain in warm water and soap If stain does not come out, cover with borax, let stand one hour, and wash with cold water

COFFEE Remove stain by pouring hot water on it from a height

FRUIT Arrange stained portion of material over bowl and pour boiling water or milk through it Borax or bleach solution will help to remove stubborn stains

GREASE Wash stain in cold or lukewarm water with soap If slight stain still remains, use mild bleach solution

INK Soak in milk or salt and lemon juice (Permanent ink cannot be removed )

IODINE Wasb spot with alcohol or diluted ammonia

IRON RUST Sprinkle stain with salt, moisten with lemon juice Lay material in the sun Wet several times with lemon juice until stain is removed Wash thoroughly

LIPSTICK OR ROUGE: Work in petroleum jelly or glycerin, then wash in warm soapy suds. Do not use soap before the stain has been loosened, as the alkali in the soap may set the stain.

MEDICINE: Wash in cold water or soak in alcohol.

MILDEW: If stain is fresh, wash in cold water and dry in the sunshine. If the stain is stubborn, make a paste of lemon juice and starch and let it stay on the spot for 48 hours.

MUCUS OR PUS: Soak stain in cold solution of one cup of salt to a gallon of water. Rinse thoroughly and boil.

PERSPIRATION (*for white cloth only*): Add a little ammonia or bleaching solution to water and rinse thoroughly in clear water.

SCORCH: Wash stain in cold water and dry in the sunshine.

WINE (*fresh stain*): Use salt with boiling water or milk. Cover quickly wlth a thick layer of salt. Pour hot water over stain from a height.

## *ACCIDENT PREVENTION IN THE HOME*

Statistics show that more accidents occur in the home than anywhere else; therefore every reasonable effort should be made to minimize hazards. Although good work habits may wipe out some carelessness, the following hints cover certain common yet dangerous situations:

1. If poisons must be kept on hand (poisonous cleaning supplies or medicines, for instance) they should be plainly labeled, and put in an inaccessable place, preferably under lock and key.
2. Insecticides should not be kept or used near foods.
3. An electrical connection or appliance or radio should never be touched while one is in the bathtub or using the washbowl.
4. A flashlight, rather than a lighted match, should be used in the dark.
5. Wet or waxed floors are slippery. A fall may cause a sprain or a broken bone.
6. To avoid a possible explosion, the oven of a gas stove should be opened before the burners are lighted.
7. Pans whose handles are left protruding from the stove are easily knocked over, causing burns.
8. Matches should be kept in a metal container, out of the reach of children.
9. A supply of salt or baking soda should always be kept near the stove, ready to be thrown on anything which may catch on fire.

## *SUMMARY*

Although the nurse is employed primarily to care for the sick, she may see fit to assume some responsibilities for the care of her patient's home When this duty faces her she will be proud to realize that she can do household tasks efficiently She will find both a weekly and a daily plan of much use to her She may enlist the help of the children of the household, and will be glad she can instruct them to do their work properly

Good personal and work habits make for quiet, orderly performance Methods of housekeeping are being constantly improved and new household inventions tend to simplify household tasks, but the ideals of cleanliness and order still call for well-organized effort, even when the task is only dusting or dishwashing

Since care must be given to all equipment—furniture, fixtures, and appliances—the nurse will need to know approved methods of caring for floors, bathroom fixtures, electric and gas stoves, sinks, brass, silver, dishcloths, breadbox, and electric appliances, including the electric washing machine

Stains must be removed to retain the beauty of many articles A list of stain removers is valuable for reference, but the nurse should use common sense as to whether or not the stain removal should be turned over to an expert

The home is the site of many accidents, many of which could be prevented by taking certain precautions The nurse with her own safety in mind, as well as that of others, will be alert to remove all hazards

### Questions

1 Describe a situation in which a nurse might feel it her duty to take over some household tasks
2 Name several household tasks which are performed daily in most homes
3 Name two or three household tasks which need attention once a week only
4 Discuss some good personal habits for the housekeeper

5. What are some good rules for doing housework efficiently?
6. Name three ways of sweeping a room. With what kind of vacuum cleaner are you familiar?
7. Describe how to dust a room properly.
8. What is the best way to clean bathroom fixtures?
9. Name three essential steps in dishwashing. What is the best way you know of washing dishes?
10. Describe the care of: dishcloths, towels, sink, brass, and silver.
11. What are the essential points to remember in cleaning gas or electric stoves?
12. How can a modern refrigerator be kept in good condition?
13. Name some precautions in the care of electric appliances.
14. Name some common stains which the nurse may be called on to remove.
15. Do you know why an electric switch should never be touched while a person is in the bathtub?

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# THE NURSE'S PLACE IN THE HOME

When the practical nurse first steps over the threshold of a private home, she is facing a situation different from any she ever met before, for each home has its own atmosphere and customs. The normal home is a place around which centers the life of the family. It is the one place where its members can completely be themselves. To invade its privacy, especially when it is disturbed by illness, requires both tact and understanding.

The nurse's chief duty is to her patient, but to fit into the family is one of the very best ways of relieving the patient's worries. If the functioning of the family is smooth and cooperative, the onset of illness and the coming of the nurse will not necessarily upset its stability. If, however, things in the home are at sixes and sevens she may have to point out those changes which should be made to secure the well being of her patient. She should be competent to protect her patient from noise and confusion.

It is easy to care for a patient who is always courteous and makes few demands, but to care for one who is irritable or unreasonable or is never satisfied with what is done for him requires a great deal of patience and self control. Even a "nice" patient is self-centered in illness when his world is the sickroom.

A little reflection will show the nurse that anxiety and fear alone are enough to disturb both the patient and his family. She must

make allowances for these reactions and for those resulting from different backgrounds and nationalities. In fact, with an open mind she may find her stay with a family whose tradition is different from her own both enlightening and interesting.

Since young workers lack experience, they should learn what they can about family relations. The normal family consists of the father and mother and their children, but often an older member of the family shares their life.

The nurse may find that the children are completely out of hand; that they are so spoiled that they prefer to show off rather than to cooperate. They may resent a stranger in the home, especially if she seems to be taking the place of the mother. The nurse should try to gain their respect by ignoring attention-getting behavior and giving them direct and easily understood commands as to what she wants them to do. When children know where they stand, they usually will respond to firm and courteous treatment.

Intelligent cooperation between the family and nurse for the good of the patient is the ideal to be sought. The courteous nurse is the one who can make all about her want to work with her because they like her and have confidence in her. However, the nurse must adapt herself to the family rather than expect them to change their ways to suit her convenience.

The nurse probably knows from her own experience that the cost of living—and sickness—is higher today than ever before. If she will apply the Golden Rule to the spending of the family's money for equipment and supplies and to economy in using them she will be doing well. Often expensive equipment need not be bought if the nurse is ingenious in improvising or in adapting ordinary household utensils to the needs of the patient. Even if these household articles are bought new they will not cost as much as regulation hospital or sickroom equipment. When, however, such equipment has to be purchased, the nurse should know the name and location of a reliable surgical supply house from which they may be obtained.

A great deal is expected of a nurse, and most people take it for granted that she will be efficient and carry their burdens for them. It does not occur to them to praise her, but the inner satisfaction a good nurse feels over a job well done makes the experience worth while.

## *THE DAY'S PLAN*

Let us imagine our young practical nurse inside the home, trying to make up her mind how to get started performing her basic task—taking care of her patient. She already knows a little about the illness, and has had time on the way to the home to think of the major problems she may have to meet.

She has been taught that the best way to get organized is to make a plan for the "day"—whether it actually be day or night. She now falls back on the principles she has been taught to help her adapt herself to the situation. She sees at once that she cannot work out a strict routine, as she could in the hospital, but she can save time and effort as well as prevent confusion by planning to do the same things every day in about the same order and in the same way. Then when exceptional circumstances arise, she can make changes to avoid awkward conflicts. As soon as possible she will clear the way either to resume her plan, or modify it as seems best.

### A SUGGESTED DAY SCHEDULE

If you arrive in time to prepare the patient's breakfast, give the bedpan, wash the patient's hands and face, and give mouth care before serving the meal.

If you report after breakfast, wash the patient's dishes, and assemble the equipment needed for the bath and for any treatment ordered for this time. Get fresh linen, taking into consideration that the amount of linen available will differ in every home.

| | | |
|---|---|---|
| A.M. | 8:30 | Patient rests after breakfast. |
| | 9:00 | Give treatments or exercises ordered. Proceed with bath. Comb patient's hair. If the patient can sit in a chair, turn the mattress and make the bed. If the patient is out of the room, air it. |
| | 10:30 | Give nourishment. Perform light household duties. Clean patient's room and bathroom. Care for flowers. |
| | 11:00 | Prepare midday meal. |
| | 12:00–1:00 | Serve midday meal. Follow with mouth care. Wash patient's hands. |

| | |
|---|---|
| P.M. 1:30–2:30 | Patient rests—sleeps if possible. Darken the room and maintain quiet. |
| 2:30 | Give back rub and exercises as ordered. Have room in readiness for visitors. Give nourishment. |
| 3:00–4:30 | Visitors. Watch patient's reaction and do not allow too much company. |
| 4:30–5:00 | Give necessary treatments. Wash patient's face and hands. Give mouth care. Rub back and rearrange drawsheet. |
| 5:00–6:00 | Prepare and serve evening meal. Wash patient's dishes and leave room in good order. Place articles needed at night within reach of the patient. |

Suggestions for the night nurse

1. If the patient is not asleep when you go on duty as a night nurse, make him comfortable and give him a warm drink.

2. If the patient awakens during the night, change his position and, if the room is warm enough, rub his back. Give him some nourishment, if it seems advisable.

3. Check every hour of the night to see if the patient is comfortable, but do not wake or disturb him if he is asleep.

4. Move about at night as quietly as possible, to avoid disturbing the family or patient.

5. Do not sleep during the hours you are on duty.

6. If there is no day nurse, plan to give the patient his bath and general morning care before you leave in the morning.

Suggestions for the day nurse

1. Take the temperature, pulse and respirations of a bed patient twice daily—before breakfast and before the evening meal.

2. Give medicine promptly and remain with the patient until it is taken.

3. Write your nursing notes between 11:00 A.M. and noon, and again before leaving for the day.

4. Eat your own meals after the patient has been served. You should wash your own dishes.

5. If the patient does not require all of your time, make yourself useful in the house, for your time belongs to your employer.

Suggestions for the resident nurse (whose patient is in bed)

1. Sleep near enough to the patient to be on call during the night.
2. Get up early enough to leave the bathroom free for the family.
3. Some member of the family will give midafternoon nourishment,

and will visit with him from 6 30 to 9 00 P M while you prepare for his evening care and write up your nursing notes

4 Your time off duty will be from 1 00 to 5 00 P M You should plan to get out of doors and to relax

5 Prepare the patient for the night between 9 00 and 10 00 P M and plan to retire about 10 00

If both a day and a night nurse are employed, the day nurse usually gives the bath and general morning care and the night nurse the evening care

Although the nurse may not be expected to take over all the household duties, she nevertheless may be called upon to undertake some She should not feel that it is below her dignity to make a home clean and attractive, for she certainly would be proud to dis play her skill in homemaking in her own home She will realize that the homemaker who needs her assistance will appreciate her willingness to adapt herself to the situation

## *THE SICKROOM AND ITS CARE*

The sickroom should be as far as possible from noise and odors, and it should be kept well ventilated In order to have the patient on the same floor as the bath, it may be necessary to change his room

The care of the patient's room and bath is always the nurse's duty If she occupies a room in the house, she must take complete care of it and leave it in good condition when she departs

The patient should be screened from direct drafts His eyes should be protected from the direct rays of the sun A screen may be improvised by draping a clothes rack with a sheet or blanket If a screen is not available, a chair or some other piece of furniture may be placed between him and the light

### CAUTIONS REGARDING MEDICINES

As a patient's association with medicine is likely to be depressing, it is well to keep all medicine out of sight No medicine should be left within reach of the patient If he is suspected of having suicidal tendencies, extra precautions and watchfulness are needed

Make all preparations for giving medication outside the patient's room. If a distasteful dose or treatment is in prospect, wait until the last minute before mentioning it. Be casual and matter of fact in your approach.

The bathroom should be uncluttered by unsightly appliances or equipment.

## *CAUTIONS ABOUT TALKING*

When a nurse should talk and when she should keep silent is often hard to decide. The patient may want to talk—and his main interest is his own condition. If you say nothing, to avoid saying the wrong thing, you are not being social or friendly. You should listen to the patient, but often you should not reply directly to his questions nor to those of his inquiring friends. Perhaps the following suggestions may be of help:

1. Do not discuss your personal affairs with either the patient or his family. Generally speaking, they are not interested.

2. When the patient's family or friends ask you to discuss his illness, it is better to refer them to the doctor, who can enlighten them or not, as he sees fit.

3. Never discuss other patients whom you have attended. To do so is to violate their trust in you.

4. Even if the patient seems unconscious or asleep, do not assume that he will not hear what you are saying. It is impossible to know how much of what you say he will understand.

5. Avoid whispering outside the door of the patient's room, for the listening patient may become alarmed, believing that you are discussing his illness, but are afraid to take him into your confidence.

## *HOW THE NURSE CAN MAKE GOOD IN FOUR WAYS*

The nurse has a fourfold duty: to her patient, to the family of the patient, to the community, and to herself.

Her duty to the patient. Although the nurse may get a fairly definite impression of her patient when she first sees him, she should not be hasty in her judgment. It will take time to understand him.

In the meantime, here are a few do's and don't's which may help you to get along with him pleasantly

1 Try to regard each patient as an individual Listen to his requests and bow to his preferences, whenever they do not conflict with the doctor's orders or the patient's well-being

2 Establish a courteous, impersonal relation with the patient Use the correct title of address *Mr*, *Mrs*, *Dr*, or *Miss* Do not indulge in such familiar but well meant salutations as *Honey* or *Dearie*

3 Be considerate enough to leave the patient alone with his clergyman, doctor, or friends whenever you sense that a little privacy would be welcome Stay within calling distance, but out of sight and out of range of conversation

**Her duty to the patient's family.** Although the family may be gracious enough to treat you as their guest, you should not forget that you are an employee You should never take advantage of the privileges they may extend to you Some guides to your relation to the family may be of value

1 They will appreciate, more than anything else, your intelligent devotion to the well-being of your patient

2 They will feel that since they are paying for your time while on duty, you will not use this time to plan your own hours of recreation

3 They will cooperate with you to about the same extent that you cooperate with them, particularly in the use of the family bathroom and in the ordering of food and the scheduling of meals

4 They will not want you to use their telephone for personal calls, but if such calls are necessary, they expect you to pay toll charges

5 They expect you to avoid making extra work for others, by cleaning up after yourself, and by putting everything you use back in its proper place

6 They expect you to take care of their possessions If you break anything, they expect you to report the fact, and to replace the item as soon as possible

**Her duty to the community.** The modern community has established various health services The nurse, like others who are interested in the medical arts, should try to relate them to the needs of the individual citizen With this purpose in mind, you can do the following.

1 You can be familiar with the community health services which are available

2. You can call the attention of the patient and his family to any services upon which they may call for help, particularly the visiting nurse association.

3. Over the years, you may find occasions on which you can publicize these agencies, thus widening their sphere of usefulness.

4. You may volunteer your services whenever they put on a campaign for funds.

**Her duty to herself.** You, as a nurse, owe it to yourself to create as good an impression as you can. First impressions are lasting; therefore you should consider carefully what impression you will make when you enter the home and while you remain in it. You want to uphold your dignity and the honor and prestige of your calling. You might well ask yourself, "If all nurses were to be judged by me, what would the public think of us?" You might go further and ask yourself the following questions:

1. Do I look and act as if I were interested in the patient, or do I feel, look, and act as if I were bored?

2. Have I brought with me all the personal articles, such as pen, stamps, washcloths, soft-soled slippers, and toiletries, which I will need, so that I shall not be tempted to borrow anything?

3. Do I look fresh, neat, and clean? Am I well groomed? Is my hair tidy? Is my uniform unwrinkled? Is my make-up conservative?

4. Will I remember not to smoke if the patient objects to the odor of tobacco?

5. Am I considerate enough not to use too highly scented perfume, since many patients object to a strong scent, and some have an allergy to certain cosmetics?

## *SUMMARY*

When a nurse first enters the home of her patient she realizes that his family is more worried and concerned about him than anyone else. As soon as possible she must get under way taking care of the patient on a regular daily schedule. To give and accept cooperation may relieve the situation more than anything else would.

She is responsible for the care of her patient's room and her own, if she has one. She has probably tried to provide herself with the articles she will need so that she may not have to borrow. She

improvises equipment needed for the patient whenever she can save the family the expense of buying it

She may be puzzled about when to speak and when to remain silent, yet she knows that she has the duty of treating personal facts she may learn about the patient and his family in a strictly confidential manner She soon learns that it is well to refer inquirers to the physician

In general, the nurse has a fourfold duty to her patient, to his family, to the community, and to herself She will find it to her advantage to understand just what her obligations are so that she may make her way in the nursing world smooth by gracious, intelligent approaches to all nursing situations which may arise for her

## Questions

1 Why will the nurse expect to be adaptable when she first goes on duty in a private home?
2 What is a good approach when going into a family whose background, customs, or religion are different from your own?
3 Name some ways in which a nurse can contribute toward reducing the expenses of an illness
4 Should a nurse expect praise for her efforts? Is she likely to respond favorably to commendation? What other satisfaction may she expect?
5 Outline a typical day's schedule of duty
6 At what times should a nurse take temperature, pulse, and respiration as a matter of routine?
7 Outline the general duties of a night nurse
8 Name a few desirable features of the sickroom
9 How may a screen be improvised to avoid drafts?
10 Discuss the keeping of medicines in the patient's room
11 What is the tactful thing to do if the patient is talking with his doctor, pastor, or old friends?
12 What do you think would be a good arrangement about using the family's telephone?
13 Why are soft soled slippers preferred for night duty?
14 Can you suggest a better way to handle your use of perfume than to ask the patient if he objects to it?

# 24

# HOUSEKEEPING DUTIES IN THE HOSPITAL

A housekeeper is a homemaker, which means that she not only is responsible for the health, cleanliness, and economical management of her home but is also responsible for making her family and guests happy and contented.

Each practical nurse in a hospital can be a homemaker in a small way if she does her share to keep the surroundings comfortable, pleasant, clean, and orderly; uses all hospital supplies economically, and treats her patients as she would guests in her own home.

Although the housekeeping duties are usually assigned to maids in the hospital, the nurse must be ready to assume responsibility for these tasks when the other workers are not available. She will be given her assignments by the team leader or the head nurse.

## *PREPARATION OF MEALS*

In most hospitals the meals are prepared in a central kitchen and are sent in steam tables to the various floors and divisions. However, the diet kitchen in each ward is equipped to serve special nourishment between meals. The diet kitchen must be kept scrupulously neat and clean at all times. Only cloths and towels which are clean

should be used Dishes used between meals should be washed after use and returned to the proper place at once, otherwise the diet kitchen will be perpetually untidy

Occasionally, the practical nurse will be called upon to carry out or to supervise certain duties, she should therefore know how these tasks are performed

**Care of the refrigerator.** The refrigerator is cleaned daily and the shelves are washed frequently with hot, soapy water The door of the refrigerator is kept closed when the equipment is not in use Some refrigerators need periodic defrosting

**Care of the food closet.** The food closet is examined daily and stale food is removed Twice a week the shelves are thoroughly washed with soap and water, and carefully dried

**Care of the patient's food.** The nurse is responsible for all food sent to her patients This food is kept in a place provided for it. It is marked with the patient's name It should be inspected daily so that it may be served before it spoils

**Care of the garbage container.** The garbage container should be kept tightly covered and should be emptied and cleaned daily It should be washed with hot soapy water

## *CARE OF SERVICE ROOMS AND EQUIPMENT*

### CARE OF THE MEDICINE CLOSET

The shelves of this cabinet and all articles on them should be washed, one at a time If one shelf is completely cleaned and rearranged before another is begun, any interruption of the nurse's work will leave nothing out of place *The medicine cabinet is always locked and the key is kept in a special place*

### CARE OF THE UTILITY AND SERVICE ROOMS

These rooms must be kept scrupulously clean Refuse is removed every morning Each person is responsible for returning equipment to its proper place after use The doors of these rooms should be kept closed, especially while the nurse is working, so as to keep noise at a minimum

## CARE OF BATHROOMS AND LAVATORIES

These rooms should be cleaned as follows:

1. Collect all soiled towels for the laundry.
2. The bathtub and washbowl should be washed and wiped dry each time they are used. They are cleaned daily with a nonabrasive powder.
3. Hoppers and toilets are cleaned daily, using a long-handled brush and a special cleaning compound.
4. The metal fixtures should be cleaned and polished daily.
5. Mirrors are polished every day with a clean cloth.
6. The floor will probably be washed every day.
7. Supplies such as soap, orangewood sticks, and fresh towels should be replenished as used.

## CARE OF THE LINEN ROOM

To keep the linen room in good order and clean at all times, the linen should be neatly stacked with the folds in front, on clean shelves. Placing the folds in front makes it easy to pick up one piece of linen without disturbing pieces below it.

Care of the linen. It is the nurse's responsibility to be economical in the use of linen. Counting and listing soiled linen should be done before it is sent to the laundry. Torn or stained linen should never be used. It should be folded neatly with the stain or tear uppermost and taken to a designated place specified by the housekeeping department.

*Removal of stains* is discussed in Chapter 22, "Care of the Home in Sickness."

## CARE OF UTENSILS AND EQUIPMENT

When putting away equipment, see that all enamelware, such as pitchers, basins, bedpans, and the like, is clean and dry. Flower vases are kept clean and polished, ready for use. Hot-water bottles are drained and hung away from heat.

Ice bags are thoroughly dried, a piece of dry gauze put in, the washer put in place, and the cap screwed on. Bedpans and urinals are rinsed in cold water, then in hot water after use. The reason for this is that hot water coagulates albumen or protein wastes which are

present in all excreta, thereby making it more difficult to remove Each day bedpans and urinals should be thoroughly washed in hot soapy water, rinsed, and dried (Many hospitals have bedpan washing and sterilizing units for the care of the bedpan after each use ) When a patient goes home, the bedpan, urinal, and all other equipment used are sterilized Everything that cannot be boiled is washed in a specified disinfectant

Care of enamelware. Enamelware is much less expensive in its initial cost than stainless steel, but the latter is far more durable Strong alkalis and acids ruin the glazed surface of enamel and should not be used To prevent chipping, enamelware should never be cooled or heated to extremes

Despite its inferiority to steel, enamelware is used for irrigating cans, basins, tubs, and pitchers It should be washed in cold water first, to remove any albuminous deposits, and then in hot soapy water It is sterilized by being placed either in the utensil sterilizer or in the autoclave Enamelware will crack if heated or cooled too rapidly

Care of Monel ware. Monel is as strong as steel It is easily cleaned and keeps its high finish when washed with soap and water

Care of porcelain Porcelain is washed with soap and water Yellow water stains may be removed by ammonia solution, lemon juice, or vinegar

Care of plasticware. Plastics are used both in their hard and flexible forms Plastic is light, does not chip, and is durable, if cared for properly It should not be boiled or subjected to high temperatures

## CARE OF RUBBER GOODS

Rubber articles are expensive and easily injured, and should therefore be cleaned carefully Rubber equipment should be first rinsed in cold water, then scrubbed in warm soapy water with a soft brush, wiped dry, and hung up to allow any water remaining to drain out Hot water hardens excreta, making it difficult to remove from rubber and increasing the likelihood of the rubber cracking When oil is spilled on rubber, it should be wiped off immediately, as it removes the rubber surface

When it is necessary to boil rubber articles (except gloves), salt

should be added to the boiling water before the articles are put in, as it helps to keep the rubber firm. Boiling is injurious to rubber; therefore the articles should be removed at the end of five minutes.

Rubber sheets and pillowcases should be hung on bars or put away rolled, as they will crack when folded. Rubber goods should never be hung on a radiator or near any heat.

Rubber gloves are rinsed with cold water after use and then turned inside out and washed on both sides with warm soapy water, then rinsed in cold water. Inspect for holes by filling each glove with water; the water will gradually seep out from an imperfect glove. A glove with the tiniest hole should be put away to be mended, as infections could be transmitted through the hole. Before the gloves are put away, they should be carefully dried and powdered, inside and outside.

Care of rubber tubing. Lubricant should be removed from the rectal or colon tubes to prevent deterioration. Rubber tubing should be rinsed under the cold water faucet and the water should be allowed to run through it until the water runs clear. To keep the tubing submerged, wrap it in an old clean cloth or towel; place in a basin; cover with water and boil for five minutes. Remove and drain dry. Store in the receptacle provided.

Each nurse should feel responsible for reporting missing or defective equipment or low supplies.

## CARE OF FLOWERS

The flowers sent to patients give them much pleasure and should be made to last as long as possible by proper care. The card enclosed with the flowers should be saved and given to the patient.

Flowers should be removed from the vases daily; the vases should be washed and fresh water put in.

Flowers will last longer if the stems are washed each day under running water and a little cut off the end of each stem. It is better to cut the stems diagonally, as this exposes a greater surface for absorption of water.

Removing the leaves which come below the surface of the water helps to keep the flowers fresh, and prevents their decay.

Arrangement of flowers. Pains should be taken to arrange flowers attractively and to choose tall vases for long-stemmed flowers and low vases for short-stemmed ones. Strings holding flowers in place may be cut. Each flower should be placed in the vase separately unless they have already been arranged by the florist. After the flowers have been arranged, the vase should be filled with cold water and wiped outside and on the bottom with a dry cloth. If there are a number of vases of flowers in a room, they should be placed so that the colors will harmonize.

Each vase should be labeled with the patient's name and room number, written in pencil, to be sure that it is returned to the right person.

Most plants should be watered every day, and any dead blossoms or leaves removed. Some plants, such as cyclamen, do better if water is kept in the saucer instead of being poured on the plant.

At night all flowers and plants are often removed from the rooms. They should be kept in a cool place but not allowed to freeze. They are returned to the patient's room in the morning after they are freshly arranged. When possible, consult the patient before discarding flowers which have faded.

## *DAILY CARE OF THE PATIENT'S ROOM OR UNIT*

After the baths are finished, floors are swept and dry-mopped. Both furniture and woodwork are carefully dusted.

Glass-topped furniture and mirrors are wiped with a wet cloth and polished with a dry cloth. It saves time to carry the wet cloth in one hand and the dry cloth in the other hand and to use first one and then the other.

Brass articles are polished once a week and will keep in better condition if they are rubbed with a soft cloth each day.

Radiators are cleaned once a week with a special brush.

Windows are cleaned on the inside when necessary.

Anything spilled on the floor must be wiped up immediately in order to keep the floor in presentable condition between the scheduled periods of cleaning, and to prevent accidents.

Before leaving any room or unit after finishing the daily care, the nurse should look around to be sure that everything is in order. Drawers partly closed, or cupboard doors partly open, give an appearance of disorder, even if everything is perfectly clean.

## THE PREPARATION OF THE UNIT

The unit consists of the furniture and equipment in the room or cubicle assigned to the patient. It includes the bed, bedside table, overbed table, straight chairs, screen, and lamp.

The bedside table contains utensils used by the patient, and has towel racks. The overbed table is used for the patient's tray or book, if he is able to read. Some tables are equipped with a mirror and have a compartment for brush and comb.

Other articles used by the patient, such as his bathrobe, slippers, and bath blanket, are usually kept in a special drawer or closet which is considered part of the unit.

The equipment of a private or semiprivate room is essentially the same, with the addition of a bureau, mirror, easy chair, and wastebasket.

The bed. The essential qualities of a good bed are durability, comfort, cleanliness, and accessibility. A hospital bed is 6 feet 4 inches long, 3 feet wide, and 26 inches high. The reasons for its unusual height are to get better ventilation for the patient and to afford greater ease for the nurse in giving treatments. The bed is generally constructed of hollow metal tubing, sealed at the end so that vermin and dust cannot enter; however, it may be made of wood. It has large wheels so that it can be moved easily without discomfort to the patient. Most hospitals use the Gatch bed, which is adjustable to give the patient support in different positions. Beds adjustable for height are being used in many hospitals.

*Bed rails or safety sides* of metal are adjusted to both sides of the bed to prevent the restless, unconscious, or irrational patient from falling out. *Crib sides* are attached to children's beds. The sides should be adjusted immediately after completing a treatment and never left down, for even a moment, when the patient is alone. Although the patient at first may object to being closed in, he is usually reasonable when the need to ensure his safety is explained to him.

Bed rails for use in the home may be purchased from a surgical supply house

*The mattress* must be firm enough to give support, for a soft mattress soon has an uncomfortable depression in the middle The mattresses most commonly used are made with inner springs, with a layer of hair on both top and bottom Other good mattresses are made of sponge rubber

*The mattress pad,* used in the home serves to protect the mattress It is easily laundered, since it is made of quilted cotton

*Two pillows,* one soft, filled with feathers or sponge rubber, and one hard, filled with hair, are usually provided for each hospital patient But many more pillows can be used if they will contribute to the patient's comfort Small pillows can be placed under the elbows or tucked into any hollow, like the back of the neck, to give comforting support and to prevent pressure

Special plastic pillow coverings are usually available They are used on all pillows when the patient has an allergy

*Waterproof sheet* Rubber or plastic sheeting is used to protect the lower bedding from body secretions This sheet is placed on the bed so that two inches at the top lie under the pillow It should extend to the patient's knees It is wide enough to be tucked in firmly on both sides under the mattress

*The linen* consists of two sheets, two pillowcases, a drawsheet, and a spread

The sheets should be long enough and wide enough to tuck in all around the bed and of strong enough material to stand pulling

The drawsheet, made of cotton, may be single or double It is long enough to tuck well under the mattress A drawsheet is sometimes made by folding a large sheet hem to hem It covers the waterproof sheet It is called a drawsheet because it may be pulled partly through to give the patient a cool place on which to lie

The spread is usually crinkled cotton crepe, which is light and easily washed

The blankets should be light and warm, preferably of wool with a 25 per cent mixture of cotton, as all wool blankets shrink when washed, and cotton blankets are heavy without being warm The blankets should be large enough to tuck in around the bed but should not touch the floor In the home, great care should be taken of blankets, as they are expensive Their appearance is spoiled by

frequent washing. Any stains on them should be removed at once. Cold water should be applied to the spot and then a detergent or soap and water should be used, after which the spot is rubbed dry. Sometimes airing and *brushing blankets* is all that is necessary. In summer they should be examined carefully before being aired and put away in mothproof containers.

*The bath blanket* used in most hospitals is single and made of light cotton material. On admittance, each patient is given a fresh bath blanket, which is kept with his individual equipment in his unit.

The bath blanket is used for the following purposes:

1. For covering the patient in various ways during nursing procedures
2. To give additional warmth when necessary
3. To absorb moisture
4. For the recovery bed, following an operation

## BEDMAKING

One of the first lessons which a student of bedside nursing learns is how to make a bed, because a properly made bed is essential to the comfort of the patient. A sick person needs a safe, clean, smooth, comfortable bed, with pillows properly adjusted, and a covering which is light and warm.

*To make a closed* or *unoccupied bed*

*Equipment*

| | |
|---|---|
| 3 sheets | 1 mattress pad (used in home, not in hospital) |
| 2 pillows | 1 or 2 blankets |
| 2 pillowcases | 1 waterproof sheet |
| | 1 spread |

*Method.* Arrange equipment in the order in which it is to be used, and carry it to the bedside. Place it on a dry, clean surface.

Turn the mattress from top to bottom. If it is turned only from side to side, the dent made by the patient's body will deepen in the same place. Push the mattress well up toward the top of the bed, as it always has a tendency to slide down. Cover the mattress with the quilted mattress pad.

Make one side of the bed at a time in order to save steps.

Put on bottom sheet with center crease exactly in the center of the bed, the wide hem at the top and the narrow hem at the bottom A crooked sheet will wrinkle when pulled tight Wrinkles make the patient uncomfortable and in time may cause bedsores

Keep the sheet even with the edge of the mattress at the foot of the bed Turn the sheet under the mattress at the head of the bed, and make a mitered corner, by folding it like an envelope on the working side, then tuck the sheet under the mattress

Put on the waterproof sheet with the top edge adjusted so that it will be just under the pillow after it has been placed on the bed This brings the lower edge under the patient's knees If pieces of ticking or similar material have been sewed to each side of the waterproof sheet, it will not slip Tuck in the end toward you Place the drawsheet over this and tuck it in smoothly The fold should come under the patient's shoulders

Now go to the other side

Tuck in the lower sheet at the top and bottom, make mitered corners Brace your knees against the side of the bed and pull hard, tuck in the side without losing the tension Then pull the edge of the waterproof sheet toward you and tuck it in well under the mattress Pull the drawsheet over and tuck it in firmly

Put on the top sheet, with the hem wrong side out, so that when it is turned over the blanket, the hem will be on the under side Be sure that the center crease is in the center of the bed Bring the upper edge of the sheet to the upper edge of the mattress This will leave about nine inches to turn over the blanket, and will protect it from being soiled by food or medicine

Put on the first blanket with the crease in the center of the bed Place blanket nine inches from upper edge of mattress

Put on the second blanket, if necessary, being sure that the upper edge is even with the first blanket

Turn the top edge of the sheet over the blanket

Grasp the upper sheet and blanket at the foot of the bed, in the center, and make a box pleat before tucking the lower edges under the mattress

Put on the spread and bring the upper edge to the edge of the mattress with the crease in the center of the bed Tuck it in at the foot and make a mitered corner of all the upper bedding but let the sides hang free (If square corners are required, see Fig 33B )

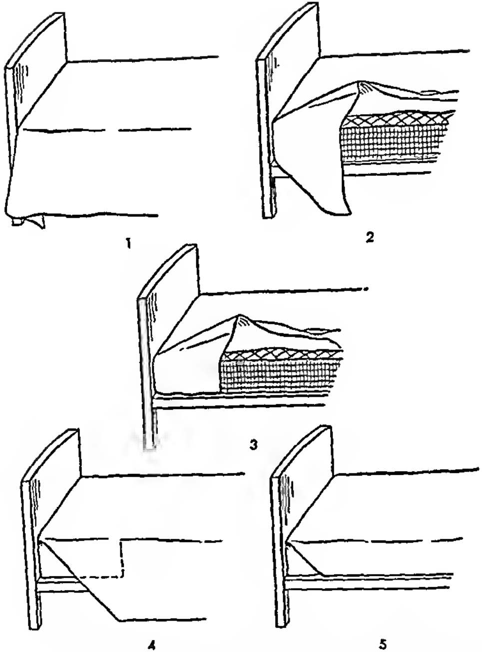


Fig. 33A. Method of making a mitered corner at head or foot of bed. *1* shows the sheet tucked under the end of the mattress. In *2* the sheet is being lifted and turned back on the mattress to make a right-angle triangle. In *3* the sheet, the edge of which is now parallel with the edge of the mattress, is ready to be tucked under the mattress. In *4* the triangle has been folded over the side of the mattress (dotted lines show arrangement of sheet beneath the fold). In *5* is shown completed corner with sheet tucked under mattress. (Modified from Wolf, L. K.: *Nursing*. Appleton-Century-Crofts, Inc., New York, 1947.)

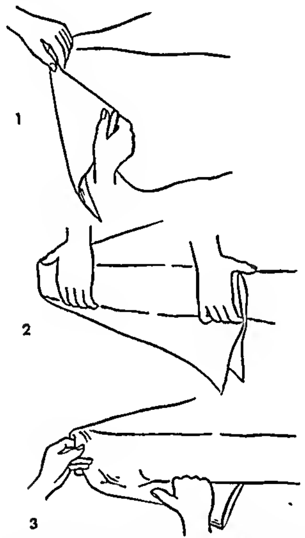


FIG 33B Method of making a square corner *1* shows sheet being picked up at the head of the mattress In *2* the hands are holding the fold of the sheet against the side of the mattress preparatory to tucking the lower edges of the sheet under the mattress *3* shows how the fold is turned over and tucked under the mattress to complete the making of the square corner (Modified from Wolf, L K *Nursing* Appleton-Century Crofts, Inc, New York, 1947 )

Go to the other side of the bed and repeat the procedure in the same order.

To put on the pillowcases, shape and fluff the pillows well and place them on a flat surface. Draw the case over the pillow, pushing the pillow well down into both corners of the case. Then place the pillow on the bed with the seam toward the head of the bed, and the opening away from the door. Press the pillow flat with the palms of

the hand from the center to the side. This is done three times to cover the surface of the pillow. Put the second case on in the same manner.

Stand off and examine the finished bed. Notice if the spread is exactly even and the surface of the bed flat. If a yardstick is laid on the bed there should be no sagging. Practice is necessary to accomplish a finished look. Notice whether all wheels and cranks are turned inward and whether the bed, if in a ward, is in line with other beds.

## *SUMMARY*

Although the housekeeping duties in the hospital are usually assigned to maids, the practical nurse may be called on to assume responsibility for them in the absence of other workers.

Regular meals are served from the central kitchen, but diet kitchens adjacent to the wards serve special nourishment between meals. All personnel using the diet kitchen cooperate in leaving it tidy after use.

Scrupulous care is given to the refrigerator, the food closet, the garbage container, the medicine closet, the utility and service rooms, the bathrooms and lavatories, the linen room and linen supply, utensils and equipment, including enamelware, Monel ware, porcelain, plastic ware, and, especially, rubber goods.

Flowers sent to patients mean much to them and deserve good care and artistic arrangement.

To see that the patient's room or unit is kept clean and in good order is the nurse's responsibility. Some tasks are performed daily, while others require care once a week, but the unit should be tidy in all respects when its daily care has been completed.

### Questions

1. What kitchen in the hospital supplies most meals?
2. What other kitchens are available for between-meal nourishment?
3. Discuss the care of the refrigerator in the hospital diet kitchen.
4. How does the nurse make sure that the food sent to the patient is served to him in good condition?

5 Describe the procedure used in caring for the medicine closet
6 How should the linen be stored in the linen room?
7 What is done with a sheet found to be torn?
8 How may yellow stains be removed from porcelain surfaces?
9 How should enamelware be protected against chipping?
10 Tell what you can about the care of flowers
11 Discuss the care of the various articles comprising "rubber goods"
12 What tasks in the care of the unit need to be performed once a week?
13 Name some tasks that are done everyday to keep the unit clean

# 25

# ADMISSION, EXAMINATION, AND DISCHARGE OF THE PATIENT

## *ADMISSION OF THE PATIENT*

What patient on his arrival at the hospital is not nervous and apprehensive? Young Bobby Green suddenly finds himself in a completely strange environment; elderly Miss White is weary and perhaps in pain; Mrs. Doe shares the distress of her family and wonders how the children will get along at home without her; Mr. Johnson thinks grimly of mounting hospital expenses—and they all finally get around to wondering how severe an ordeal they will have to face and what kind of treatment they will receive.

From the patient's first moment in the hospital until he is discharged, everyone should work together to give him intelligent care. He will gradually respond to the friendly atmosphere and his confidence will return as his morale is strengthened.

In the hospital office it will be necessary for him to give his name and address and to answer a few questions about financial arrangements with the hospital; but if he is too weak to speak for himself, his family can take over this responsibility. As soon as possible he is escorted or taken to his room.

Each hospital has its own rules about the care of the patient's belongings. If it is necessary to leave his clothing in the hospital, it is the responsibility of the admitting nurse to see that everything is

put away in a designated place All valuables and money left in the hospital are taken to the office, after the money has been counted in the presence of the patient or his family A separate slip is made out for the clothing and valuables and is signed by the patient or his relative Artificial teeth are regarded as valuables, and if they are removed from the patient's mouth, they are placed in a container plainly marked with his name

In order to avoid any error in identification the nurse makes sure that she knows the patient's name She addresses him by his name whenever she has occasion to speak to him She mentions her own name and, if she thinks it best, she may introduce patients in adjoining units

The nurse uses her judgment about how much talking is done Endless chatter is disturbing both to the patient and to others within hearing On the other hand, she will listen courteously to what the patient has to say, paying particular attention to his requests Sometimes she can pick up various bits of information about the patient which could be of service to the doctor Without attracting the attention of the patient to what she is doing, she records her observations in her "nurse's notes"

She has a good opportunity to notice his general physical and mental condition as she assists him to undress for bed, or when she is helping him to get ready for a physical examination If the patient is bewildered or nervous about the tests which will be made, she can reassure him by explaining that the doctor needs the knowledge to be gained from such tests, before treatment is given She stresses that although each test is important, each is a routine procedure

It may be embarrassing to the patient to be undressed by a strange person, so the nurse should be courteous, considerate, and natural in her manner When the patient is put into bed, she should make him comfortable, with a pillow at his back, and an extra blanket over him, if the room is cool

The patient is happier as soon as he begins to feel at home He likes to be independent and to find his way around, and should be shown the location of the bathroom and sunroom If he is blind, the nurse should help him at once to learn the exact position of the furniture and equipment in his unit

The physician writes all directions for the patient's care in the order book which is kept in the head nurse's office The head nurse

or team leader is responsible for assigning duties to the various workers or to the leader of the nursing team.

Before the patient's relatives depart, they will be relieved if they can see him reclining comfortably in bed, with fresh drinking water (if it is permitted) and a signal cord within reach. They often wait outside the room while the doctor makes at least a preliminary examination.

All personnel connected with the hospital can help to create a favorable impression on the patient and his family. Their loyalty, backed by courteous and efficient service, are definite factors in building and maintaining good public relations. Deeper than the creation of a good impression is the satisfaction of knowing that every patient has received the maximum benefit during his stay in the hospital.

## *THE NURSE'S EXAMINATION OF THE PATIENT*

### TEMPERATURE

**Measurement of heat.** Heat is produced in the body as a result of muscular activity and of the oxidation, or slow burning, of food. (See Chap. 9, "Circulatory System.") It is increased by the process of digestion, by the absorption of food, by exercise, worry, excitement, or constipation. It is lost by evaporation through the skin, through the lungs, and in the wastes of the body.

All forms of heat are measured by some kind of scale. The Fahrenheit scale or thermometer is the one most commonly used for the measurement of body heat. Another scale, the centigrade, is coming into general use.

**The normal temperature.** The normal temperature of the interior of the body is 98.6°F. (37°C.). This temperature is maintained by a perfect balance between the heat-producing and heat-losing processes of the body.

**Variations in temperature.** When the temperature rises or drops it is a sign that the body is not functioning properly. In children a variation in temperature is not so important as in adults. The signs of a high temperature or fever are: a flushed face; bright, glistening eyes; hot skin; thirst; and restlessness. Convalescent patients are apt to have a subnormal temperature, but any slight disturbance, such

as a change of diet, worry, excitement, constipation, or fatigue caused by sitting up too long or having visitors, may raise their temperature

| | | |
|---|---|---|
| Subnormal temperature | 97° to 98°F | 36 1° to 36 6°C |
| Normal * | 98 6°F | 37°C |
| Fever of moderate degree | 100 5° to 103°F | 38° to 39 4°C |
| High fever | 103° to 105°F | 39 4° to 40 5°C |

Crisis and lysis After the temperature rises, it returns to normal or below normal in one of two ways by crisis or by lysis

Crises is a sudden fall to normal or below in a comparatively short time It is accompanied by a decrease in pulse and respiration, general improvement in the patient's condition, profuse sweating, and an increase in the amount of urine voided At this time the patient must be closely watched, kept warm and quiet, and given hot drinks and stimulation, if necessary, to prevent collapse

Lysis is a gradual fall to normal or below normal and may take several days

Sometimes when patients are very ill or near death, the temperature falls with no decrease in pulse and respiration The practical nurse should always report any such marked or sudden variation

Clinical thermometer To determine the temperature of the interior of the body, a special thermometer, Fahrenheit or centigrade, is used It consists of a glass tube on which there is a graduated scale beginning at 94° or 95°F (34 4° or 35°C ) and ending at 108°F (42 2°C ) In the scale each long stroke indicates a degree It will be seen that only every other stroke is numbered The short strokes represent two tenths of a degree The arrow indicates normal temperature The line of reading is on the ridge between the figures and the strokes At the lower end of the thermometer is an enlargement called the bulb The bulb is filled with mercury, which expands when it comes in contact with heat and sends a fine column up the tube The place where the mercury stops shows the degree of temperature

Since in the clinical thermometer the mercury continues to register the height it has reached, it must be shaken down to 95°F (35°C ) before taking the temperature To shake the thermometer, hold it between the second and third fingers and thumb, with the bulb downward, flexing the hand slightly, and giving the ther

* Normal temperature for some persons is 98°F (36 6°C ), and in some rare cases even below this figure, or it may be 99°F (37 2°C ) or slightly above

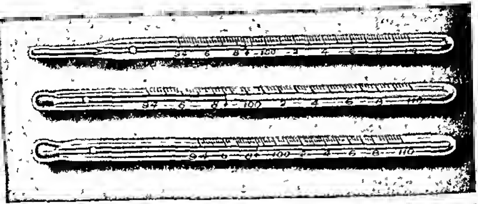

FIG. 34. Clinical thermometers used to measure the interior temperature of the body. The two top thermometers are used for taking temperature orally and the lowest thermometer for taking the temperature by rectum. (Courtesy of Becton, Dickinson and Company, Rutherford, N.J.)

mometer a quick sharp jerk. Care should be taken not to shake it below 95°F. (35°C.), as it is difficult to get the mercury up again.

**Time to take temperature.** The temperature is taken at the same time daily to make comparisons more reliable: usually at eight o'clock in the morning and at four in the afternoon or eight o'clock in the evening.

Sometimes the temperature is taken every four hours, at eight, twelve, and four o'clock, both day and night.

**Where the temperature is taken.** Temperature is taken in one of three places: in the mouth, in the rectum, or in the axilla (armpit), where the thermometer can be surrounded by body tissue and where the large blood vessels are *near* the surface.

**To take the temperature by mouth.** Always wash your hands before taking a temperature. In the hospital unit a thermometer is usually part of the standard equipment. It is kept in a separate glass container. In the home, the patient has his own thermometer or uses the one supplied by the nurse.

*Equipment*

Tray or plate
Thermometer
Pad
Pencil
Watch with second hand
Petroleum jelly, if rectal thermometer is used
Glass of clean water
Glass jar for waste
Small tissue wipes in glass jar
Thermometer container with antiseptic solution and absorbent cotton in the glass to prevent breakage

*Procedure* Wipe the thermometer with tissue or cotton dipped in water, shake it down, and place the bulb end containing the mercury under the patient's tongue Instruct the patient to close his lips tightly The thermometer must be left in the mouth for at least three minutes in order to register accurately After removing it from the mouth, wipe with tissue to remove mucus Read the degree of temperature and record it at once

Some thermometers register in a minute, but it is safe to leave any thermometer in the mouth for fully three minutes

Be careful never to touch the part of the thermometer which goes in the patient's mouth, either before or after taking the temperature Remain with the patient while taking his temperature Always allow at least fifteen minutes to elapse after the patient has taken either hot or cold nourishment, or the temperature recorded will not be accurate

Never take the temperature by mouth if the patient is coughing or breathing with difficulty, as it is impossible to keep the mouth closed in either of these conditions Never take the temperature by mouth if the patient is delirious or unconscious, as there is danger that the bulb may be bitten off If this happens, notify the head nurse or call the physician at once Be sure no particles of glass are left in the patient's mouth

When not in use, the thermometer is kept in a metal or hard rubber case to protect it from breakage When in constant use it is kept in a glass filled with an antiseptic A piece of absorbent cotton should be placed in the bottom of the glass to prevent breakage Before the thermometer is put into the patient's mouth, it is always cleaned to remove traces of antiseptic This will prevent possible poisoning or irritation of the mucous membrane

To take the temperature by rectum The temperature of infants or young children is taken either by rectum or in the axilla In adults it is taken by rectum when it is not advisable to take it by mouth The rectal temperature is one degree higher than mouth temperature It is taken by a special thermometer, distinguished by the different shape and color of the bulb The rectal temperature is the most accurate

After washing and shaking down the thermometer, lubricate the bulb end with petroleum jelly or olive oil The patient should lie on his side, if possible Insert the thermometer about one inch slowly

and gently. This is especially necessary with children to avoid injuring the delicate membrane. The thermometer should be held in position for at least three minutes. After removing it, wipe with tissue or cotton and record at once.

The temperature will be inaccurate if, on withdrawal, the bulb is covered with fecal matter. The bulb should be cleansed, and the thermometer shaken down and inserted again. Always allow fifteen minutes to elapse after giving an enema before taking a rectal temperature.

*To take the temperature of an infant or young child by rectum,* lay him on his back on the bed or face downward across your knees. When he is lying on his back, the legs should be crossed, flexed, and held together with one hand, while the well-lubricated thermometer is inserted and held in place with the other hand. This will restrain the child if he struggles and will prevent breaking the thermometer.

When the child is lying face downward across your knees, the direction of the rectum is changed; the thermometer should therefore be inserted with the bulb pointing toward the umbilicus. In this position, the child can be restrained with your left arm and hand. Always hold the thermometer until it registers. (Never leave a child of any age alone while the thermometer is in place.)

To take the temperature by axilla. The temperature is taken by axilla only when it is inadvisable to take it by mouth or by rectum. The temperature in the axilla registers from one-half to one degree lower than the mouth temperature. A rectal thermometer should be used. The axilla should be wiped dry, and the bulb end of the thermometer placed in the hollow. The forearm should be flexed toward the chest and held closely for ten minutes, if the patient is unable to keep it so himself. Remove the thermometer, read the degree of temperature, and record it.

Aftercare of thermometer. After use, the thermometer should be cleaned with cold running water. Never use warm water, as what seems lukewarm to the hand may break a thermometer. After the thermometer has been washed, it is placed in an antiseptic solution. Hospitals vary as to the antiseptic solution used. The nurse is expected to follow the hospital rules for the care of thermometers. When the thermometer is used for more than one patient it should not only be carefully washed and rinsed in cold water, but should

also be submerged for a few minutes in alcohol or in the particular solution ordered before it is used again Rectal thermometers are always kept separately from mouth thermometers They are cleaned with soapy water and rinsed in cold water before being placed in the antiseptic solution

Points to remember in the home

1 Be sure to wash your hands before taking a temperature

2 Be sure the thermometer is properly cleaned before and after taking a temperature

3 When the temperature is high, the nurse should be careful to save the patient from any exertion or excitement and should regulate the amount of bedclothing and the temperature of the room

4 When the temperature is below normal, every effort should be made to increase heat production in the body by providing extra coverings, hot-water bottles, and hot drinks Other measures will be added by the physician, to whom every sudden change in the patient's temperature should be reported immediately

## THE PULSE

When we speak of the pulse, we mean the beat which is felt in the arteries as they expand when a wave of blood is forced through them by the contraction or systolic action of the heart The interval between beats is the period occupied by the relaxation or diastolic action of the heart as it fills with blood

A normal pulse has perfect rhythm, moderate rate and tension, good volume, and a moderate amount of resistance to compression The pulse not only indicates the general condition of the patient but is a good index of the condition of the heart, the blood vessels, and the circulation The time between each beat is the same, and the artery feels full and strong under the fingers

When the heart action is steady, the patient has a better chance of recovery than when it is weak or irregular.

A marked variation in pulse sometimes is more serious than a change in temperature

Differences in pulse rate and strength are difficult to learn, and the only way to acquire skill is by practicing on the normal pulse

When you are sure that you know a normal pulse, you can begin to practice on an abnormal one You learn to note the frequency, force, tension, and rhythm of a pulse

Frequency. Frequency means the number of beats in a minute.

*Average rate per minute*

| | |
|---|---|
| For men | 60 to 70 |
| For women | 65 to 80 |
| For children over 7 years | 72 to 90 |
| For children from 1 to 7 years | 80 to 120 |
| For infants | 110 to 130 |

The frequency of the pulse is increased in a healthy person by exercise, emotion, excitement, taking food or stimulants, and even by change in position, as the pulse is slightly higher when a person is standing than when he is lying down. It is decreased normally by sleep, fatigue, exposure, and fasting. It is slower in old age than in youth.

A very rapid pulse—above 160 per minute—is called *tachycardia*; and a very slow, infrequent pulse—below 50 per minute—is called *bradycardia.*

Certain drugs, such as caffeine, increase the rate, while others, such as digitalis, decrease it. An increase in temperature causes an increase in the pulse rate. An increase in the pulse rate also occurs when there is oversecretion of the thyroid gland and in fevers due to infection.

Force or volume. Force is the strength of the beat as it is felt by the fingers. The heat is called *strong* when all pulsations are uniform or equal in strength. When some pulsations are weak and others are strong, the pulse is said to be *irregular*. When the beats are of more than usual force, the pulse is described as *bounding*. When the pulse is weak or flickering, the beats are below normal force. The pulse is called *thready* when it is weak and running. This pulse is usually found accompanying hemorrhage and shock. It is also an indication that the patient is in critical condition. It may be a sign of approaching heart failure.

Tension. Tension is the resistance offered by the artery to the finger and is due to the pressure of the blood within the vessels. Low tension occurs when the arterial walls are relaxed and it is possible to compress the pulse with the fingers until no beat is felt.

Rhythm. Rhythm is the pattern or spacing of the heart beats. It may be regular, irregular, intermittent, or dicrotic. *Regular* means that the pulse beats are of uniform force and spaced at intervals of equal length.

In an *irregular* pulse, the beat and the interval between the beats varies

In an *intermittent* pulse, the beat is skipped at either regular or irregular intervals

In a *dicrotic* pulse, the beat appears to be divided and two pulsations are felt, the second part of the beat being weaker than the first


FIG 35 Taking pulse and respiration Poor and good body mechanics

**To take the pulse.** The pulse is usually taken at the wrist over the radial artery on the thumb side, though it may be taken wherever a large artery comes near the surface—at the temple, ankle, or groin The patient should be lying or sitting down with the arm at rest on the abdomen or chest

Place the tips of the first three fingers over the radial artery, making slight pressure Count the beats in one minute After practice, the beat can be counted in half a minute and the rate multiplied by two before recording On seriously ill and postoperative cases, the pulse is always counted for a full minute

*Points to remember*

1 Never take the pulse with the thumb, as there is an artery in the thumb

2 Never take the pulse after exercise or excitement

3 Do not press too hard upon the artery, as you will be unable to feel the pulse at all

4. After counting, keep the fingers on the artery and note other qualities in the pulse, such as its force and compressibility.

## RESPIRATION

Respiration is the mechanism by which fresh air is taken into the body. (See Chap. 11, "The Respiratory System.") The process of taking air into the lungs is called *inspiration* and that of giving out the used air is called *expiration*.

**Rate of respiration.** The average rate of respiration is as follows:

| | |
|---|---|
| Men | 16 to 18 per minute |
| Women | 18 to 20 per minute |
| Children | 20 to 25 per minute |
| Infants | 30 to 35 per minute |

When the rate per minute is below 12 or above 40, and continues at that rate, it is a dangerous symptom.

Respiration is normally increased by exercise, eating, and excitement. In children it may be rapidly increased by crying, but will return to normal in a few minutes. It is abnormally increased in certain diseases, such as pneumonia, uremia, asthma, hysteria, some forms of cardiac disease, and by certain drugs, such as caffeine and atropine.

Respiration is normally decreased by fatigue, rest, and sleep. It is abnormally decreased in brain tumors and by certain drugs, such as morphine.

**To take the respiration.** The respirations should be counted without the patient's knowledge, since although breathing is an involuntary act, the patient is likely to breathe faster or slower when he knows he is being watched.

Watch and count the rise and fall of the chest while you are apparently doing something else, or keep your fingers on the pulse after counting the pulse beat and count the respirations. The two movements of the chest wall when the breath is inspired and expired are counted as one movement. Count for one minute, using a watch with a second hand and record the rate at once.

**Conditions to be observed.** You should learn to notice whether the respirations are shallow or deep, if the chest walls are expanded normally, and if there is dyspnea or other abnormal conditions.

Dyspnea is difficult or labored breathing. It is caused by any

condition which interferes with the amount of oxygen taken into the lungs (as in croup, asthma, pneumonia), by heart and brain conditions, or by certain drugs

SHALLOW RESPIRATION occurs when only a small amount of air is taken in This may be due to pain in the chest, as in pleurisy or pneumonia

DEEP RESPIRATION is usually due to some brain pressure caused by injury or disease

When there is thoracic pain, as in pleurisy, pneumonia, or tuberculosis, the chest does not expand properly Sometimes the location of the pain can be determined by the way the chest expands

STERTOROUS BREATHING is a noisy, snoring sound, characteristic of apoplexy and alcoholism

RALES are rattling noises caused by the collection of mucus in the air passages and are characteristic of pneumonia and bronchitis

WHEEZING is a whistling sound of air as it is forced from the air passages, and is characteristic of asthma

ORTHOPNEA is inability to breathe lying down

CYANOSIS is a condition caused by shallow inspirations, long continued The mucous membrane of the lips, nose, and eyes becomes blue, as do the fingernails This condition is due to imperfectly oxygenated blood in the capillaries

In persons very ill with certain diseases, we observe what is known as *Cheyne-Stokes* breathing The respirations gradually increase in depth and rate and then gradually decrease, after a pause the cycle begins again This form of breathing usually precedes death

**Points to remember in the home.** The physician will always want to know the temperature, pulse, and respiration of the patient, therefore it is very important to take them at regular intervals, and to record them accurately Always record them immediately after you have taken them

## BLOOD PRESSURE

The measurement of blood pressure is one of the most important routine procedures in the investigation of every patient The blood pressure, when above or below the normal range, indicates certain diseased or disturbed physical conditions The nurse should under-

stand the principles on which blood pressure and its measurement are based. (See Chap. 9, "The Circulatory System.")

The term *blood pressure* refers to arterial blood pressure, that is, the pressure required to pump blood through the arterial system. Two types of blood pressure are to be noted: one, the systolic pressure, which gets its name from the word *systole* meaning "contraction." It refers, therefore, to the pressure in the arteries at the time the left ventricle of the heart contracts and forces blood out through the open heart valves into the aorta and smaller arteries. The other is the diastolic pressure, which gets its name from the word *diastole* meaning "relaxation" and refers to the pressure in the arteries at the time the heart muscle relaxes between contractions and the heart valves close. Thus, the diastolic pressure will always be lower than the systolic pressure. These two pressures, the systolic and the diastolic, are measured with the sphygmomanometer, sometimes abbreviated to manometer, as explained below. The mathematical difference between the two pressures is called the pulse pressure. For example, in a normal person if the systolic pressure is 120 and the diastolic is 80, the pulse pressure would be 40.

Blood pressure varies under different conditions in the same individual; it also varies in different individuals. It is normally affected by excitement, worry, altitude, age, sex, and muscular activity. It is normally higher in men than in women and lower in children and infants than in adults. It increases with age, excitement, and heightened muscular activity. It decreases when a person is asleep or lying down. It is decreased abnormally by shock, hemorrhage, lowered activity of the adrenal glands, and by certain drugs, such as amyl nitrite and nitroglycerin.

The height of the blood pressure—the systolic pressure—is affected by (1) the amount and force of the blood put out by the contraction of the left ventricle (cardiac output) and (2) by the ease with which the blood passes through the smaller arteries, called arterioles. Generally the output of blood by the heart is constant. Therefore differences in blood pressure are due to variations in the degree of contraction, relaxation, and elasticity of the walls of the arterioles. In high blood pressure, or hypertension, the walls of the arterioles tend to be constricted, thus making the heart work harder to force blood through them.

To take the blood pressure. The upper arm is the part of the

body used for the measurement of blood pressure for two reasons First, it is a convenient size, shape, and place for applying the cuff of the sphygmomanometer, and second, because the large brachial artery lies near the surface of the inner side of the upper arm, just above the bend of the elbow

Two instruments are used in measuring blood pressure a stethoscope and a sphygmomanometer The latter consists of a *manometer* (scale and a glass tube containing mercury) connected by a piece of rubber tubing to an inflatable rubber bag enclosed in cotton cloth, called a *cuff* A second piece of tubing connects the bag to an air pump and valve called a *bulb* The sphygmomanometer is placed on the bedside table or on any firm, flat surface

When a patient sees the apparatus for the first time he should be given a simple explanation of why and how it is used It is well to tell him that his arm will be tightly squeezed for a few moments when the cuff is inflated The patient should be in a comfortable position, either seated or lying down Wrap the cuff snugly and evenly around the upper arm, usually the left arm, with its lower margin about two inches from the bend of the elbow with the two rubber tubes extending downward toward the hand Place the ear pieces of the stethoscope in your ears Locate the pulse of the brachial artery just below the bend of the elbow, and with your left hand hold the bell of the stethoscope lightly but firmly in place over the pulse It should not touch the cuff Close the air valve of the bulb and inflate the cuff by squeezing the bulb until all sound ceases Then open the valve slightly, allowing air to escape slowly until you hear the first sharp snapping sound At this moment the level of the column of mercury on the scale should be read, for this is the systolic pressure While still listening and watching the mercury, allow more air to escape The sounds change, at first becoming louder and clearer, and then, suddenly, dull and muffled, until they finally disappear At the point of the sound becoming muffled the diastolic pressure is read on the scale

It is necessary that the reading should be as accurate as possible Therefore the procedure is repeated Let all the air out of the cuff, wait a minute to relieve pressure, and start the procedure again Record at once, thus

$$\text{B P} \quad \frac{130}{70} \quad \begin{matrix}\text{(systolic)}\\ \text{(diastolic)}\end{matrix}$$

It is only natural for a patient to be somewhat apprehensive and to want to know whether his blood pressure is high. Under these circumstances, the nurse should suggest that the patient ask his physician instead of her.

## *SPECIMENS AND TESTS*

After the incoming patient has had his physical examination the doctor will make a list of the specimens he wishes collected and the tests to be made. The usual tests made are of urine, feces, sputum, and blood.

The blood tests are generally taken by the physician or intern shortly after the patient has been admitted. They bring their own equipment. If necessary the nurse should reassure the timid patient and explain that they send the blood to the laboratory for analysis. She should point out that it is necessary to make the test to get a correct diagnosis and to prescribe proper treatment.

All specimen containers should be plainly labeled. The label should give the necessary identifying information: the name of the patient, the date, the time taken, the patient's room (building), the name of the physician, and any particular condition, which should be noted as *admission*, *preoperative*, *postoperative*, or *diabetic*.

### URINE SPECIMEN

Either a single specimen or a 24-hour specimen of urine may be required.

**Single specimen.** The patient should be asked to void in a urinal, clean bedpan, or other receptacle, being careful not to have any fecal material get into the urine if a bedpan is used. (If the patient wishes to have a bowel movement, two bedpans should be used; or if the patient is a male, a bedpan and a urinal.) The best time to get a specimen is before a meal; usually before breakfast. About 4 ounces of the urine should be poured into a clean 4-ounce bottle, then the bottle should be tightly capped and labeled.

**Twenty-four hour specimen.** For this specimen a gallon bottle will be needed, as all urine voided within a 24-hour period must be saved. If the period begins at seven o'clock in the morning, as it gen-

erally does, the patient should be asked to void at that time This urine is discarded, but all other urine is saved including that voided at seven o'clock the next morning From 4 to 16 ounces of this quantity may be sent to the laboratory, or the whole amount may be required

Urine is usually tested for specific gravity, casts, albumin, sugar, acetone, and diacetic acid To obtain a specimen of sterile urine from a patient, a catheter is used All urine specimens should be sent to the laboratory as soon as possible, since urine deteriorates very rapidly

Points to remember in the home

1 Instead of the room number, write the patient's address on the label

2 The physician may take the specimen with him or he may ask you to mail or deliver it If you mail it, pack it carefully, to avoid breakage

3 If the patient is menstruating, the physician may wish to delay the test, so report the condition to him

4 Be sure the bottle will hold at least 4 ounces, and that the cap is spill proof

5 The physician may direct you to send the specimen to a state or local department of health You should know about these and other public health services in the community

Collection of urine specimen from an infant

*Equipment*

| | |
|---|---|
| Glass adapter with flared top and opening at bottom | Gauze binder |
| Rubber tubing (approximately 3 ft long) | Pillow |
| Specimen bottle | Chest restraint |
| Specimen binder | Double ankle restraint |
| | Safety pins |
| | Laundry bag |

*Procedure* Tie specimen bottle to foot of crib with gauze bandage Attach one end of rubber tubbing to small end of glass adapter Insert other end of adapter through opening in specimen binder (made especially for this purpose) Pin wide part of binder around infant's abdomen and adjust the tube over penis of the male or meatus of the female Avoid constricting penis, or chafing the labia Bring narrow ends of binder around either thigh Pin securely

to wide band. Place chest restraint on child, and secure it to bedsprings. Fasten the child's legs in double ankle restraint, securing it to the bedsprings. Place unattached end of rubber tubing into specimen bottle tied to foot of crib. Place pillow under head of mattress in order to elevate the upper part of the child's body. Arrange top bedding over the infant. Observe him every 15 to 20 minutes until he has voided.

*Note:* The infant may be picked up for his feeding, if necessary, while the urine collection is going on. Release the chest and ankle restraints. Be sure that the urine specimen restraint and adapter are in place and the rubber tubing is not disconnected from the specimen bottle. Upon collection of the specimen, remove the restraints from the baby and make him comfortable. Discard restraints in the laundry bag. Wash the glass adapter and rubber tubing in soap and water, rinse, and autoclave or sterilize for 10 minutes. Replace the equipment. Take the labeled urine specimen to the laboratory. Record on bedside chart the time the child was prepared for specimen and the time specimen was obtained.

## FECES SPECIMEN

Feces normally contain bacteria, cellulose, undigested connective tissue and fats, toxins from meat proteins, water, and mucus, but they also contain matter which is not normal. Feces are tested, therefore, to discover the presence of abnormal contents, such as blood, disease-producing bacteria, pus cells, and worms, parasites, and their eggs. Some diseases, such as typhoid and paratyphoid fevers and dysentery, and such conditions as gastric ulcer and gallbladder disorders are revealed when a specimen of feces is analyzed.

To collect a specimen of feces. Generally, it is only necessary to use a wooden blade to remove a small quantity from the mass and deposit it in a container, being careful not to contaminate the outside. This specimen should be covered and rushed to the laboratory. It is important that the specimen be warm when examined, as certain microorganisms it may contain can be seen under the microscope only as they move across the glass. But they will move only while the medium in which they exist is warm.

Semiliquid specimen. When a semiliquid specimen is needed, the physician will generally order a saline cathartic to produce watery

stools The nurse will take the specimen from the first movement after the cathartic has been administered To collect such a specimen, the nurse waits for the patient to express his desire to defecate She warns him not to void at the time the specimen is being collected She inserts a rectal tube into the rectum and places the free end in the container for the specimen As soon as she has collected enough for the specimen, she removes the rectal tube and wraps it in paper The specimen is covered and its container is placed in a pan of warm water so that it will arrive at the laboratory in good condition for testing If this procedure cannot be carried out, the patient uses a bedpan, which is kept warm while it is being transported to the laboratory Cleanse the rectal tube, boil it for 5 minutes, and return it to its proper place

## SPUTUM SPECIMEN

Sputum is examined for odor, amount, color, and consistency Under the microscope tubercle bacilli, other cells, and crystals may be revealed

In the morning the sputum shows the condition of the bronchial tubes, therefore the sputum specimen is generally collected at that time The sputum of patients suffering from acute respiratory infection is usually tested as soon as possible after admission

A wide mouthed bottle or a special receptacle provided by the hospital is used to collect the sputum The patient is instructed not to contaminate the outside of the receptacle A waxed sputum cup, kept within reach of the patient during the entire period, is used to collect a 24-hour specimen It has the advantage of being burned easily after use

The nurse should ask the patient to cough to be sure that the material collected for the specimen comes from the bronchial tubes or lungs rather than from the mouth, nose, or throat

The specimen should be plainly labeled and sent to the laboratory without delay

## VOMITUS

The content of the stomach, when ejected through the mouth, is called vomitus A specimen of vomitus may be analyzed either to

determine the cause of this disturbance or it may be needed if there is any suspicion that the patient has been poisoned. Therefore, whenever the vomitus is unusual in character, the emesis basin containing this material should be saved for the inspection of the physician, who may order the entire specimen sent to the laboratory or may decide that a small specimen is sufficient. The single specimen is collected in a sputum cup or other specified container, covered tightly, and properly labeled before being sent out.

Vomitus containing blood, mucus, pus, fecal matter, or any other unusual substance should be saved, but if the patient is at home it should be kept out of sight of the family. Discharges of blood in the specimen warrant notifying the doctor at once.

Vomitus may vary in color. Each color is of significance to the physician, so it should be noted and described accurately. If it is either green or greenish-yellow, it contains bile and has been forced back from the intestines into the stomach. If it resembles coffee grounds, it contains blood which has been in the stomach long enough to have been digested. This color is a danger signal; the doctor will wish to see the specimen at once, for the patient may have had a gastric hemorrhage. Brown vomitus which has a fecal odor may indicate that there is an obstruction in the intestines. Bright red blood may indicate hemorrhage. The food eaten may color the vomitus.

Other characteristics besides color to be noted are: amount, odor, consistency, and the force with which the vomitus is ejected. The amount may be measured, especially if it is large; the odor may be sour or purulent; the force may be slight or the vomitus may be expelled like a projectile. The consistency of the food eaten or the presence of mucus may affect the consistency of the stomach contents.

Since any of these characteristics may mean more than one possibility, only the physician may be able to interpret it correctly. He can be aided by careful observations made by the nurse.

Vomiting is usually a reflex action. Some muscles contract and others relax to eject the material. The stomach can be easily upset both by physical causes and by mental and emotional suggestions. Patients vary in their sensitivity to such suggestions, but some are upset even by a discussion of food. Nearly all stomachs react unfavorably to shock, fear, disagreeable subjects of conversation, and

unpleasant odors Therefore a patient should be protected against these disturbing influences as much as possible

The patient who is about to vomit may not wish to see the emesis basin in readiness, but he may be relieved to know that it is available During vomiting he should be assisted, his head should be turned to prevent his choking, his forehead supported by the nurse's hand, the basin held under his chin His clothing and bedding are protected with towels and possibly waterproof sheeting

When the patient finishes vomiting, his mouth should be rinsed with water to get rid of disagreeable tastes and odors He should rest long enough to recover from his exertion Until the doctor has seen the patient and given his orders, all food and drink should be withheld from the patient

All trace of vomitus should be removed Soiled linen is replaced with fresh linens The notations made by the nurse should be exact and fully descriptive They should be made at once

## REMOVAL OF SPINAL FLUID

Sometimes the practical nurse is asked to assist the physician while he is removing spinal fluid Her main duties are to reassure the patient and be ready to help the doctor if she is needed

Within the cavities of the brain and in the spaces outside the brain and spinal cord, there circulates a clear fluid which is called the *cerebrospinal fluid*, or spinal fluid, for short Since this fluid is in immediate contact with the brain and spinal cord, it is of great importance in diagnosis to the physician As a needle can be inserted with safety into the fluid in the lumbar spinal region, the procedure is called "lumbar puncture" *

Normally the fluid is crystal clear and when seen under the microscope contains no cells When there is meningitis, the fluid is cloudy because of the pus cells which are present When there has been a severe hemorrhage the fluid will be bloody

Certain chemical determinations are also done on the fluid They include protein, sugar, and chlorides The presence of syphilis of the nervous system may be recognized by a positive Hinton or Wassermann test

* Harmer Bertha and Henderson Virginia *Textbook of the Principles and Practice of Nursing* 5th ed The Macmillan Company New York 1955 pp 810–15

The patient lies on his side, with his head and legs bent. A blanket is placed over his shoulders, and another covers his lower extremities. The physician asks the patient to stay in this positio during the procedure, as a sudden movement would bend the needle The nurse will hold a child or an unconscious patient in the require position by keeping one hand on his head and the other hand unde his knees.

The lower back is washed and painted with iodine or Merthic late. Local anesthesia is induced with procaine injected through small needle. Then the special spinal needle is introduced in th mid-line so that it goes between two vertebrae into the spinal fluic A manometer is placed on the needle and the fluid is allowed t run into the manometer. A pressure of over 200 mm of wat usually means that there is some abnormal process, such as a tumo an abscess, or a blood clot producing the pressure increase.

Occasionally a patient develops a headache after lumbar pun ture. This headache comes on when he sits or stands. Usually it las only a few days at the most. The patient can remain comfortable long as he lies down.

To collect a specimen, the test tube is held just below the need as the stilet is removed. The puncture is cleaned with alcohol ar covered with sterile gauze. The doctor usually takes the specim with him. The patient should be watched constantly. Headach and nausea should be carefully checked.

## BASAL METABOLISM TEST

The basal metabolism test is made to study the rate at whi the body uses oxygen. It is used in diagnosing thyroid conditio Usually the patient has nothing to eat after six o'clock the precedi evening, and breakfast is delayed until after the tests are made. T patient should be cooperative; the nurse can help by explaini the procedure.

The patient lies on his back as completely relaxed as possible f half an hour before the test is given so that he is in almost the sa condition as if he were asleep. The nose is clamped and the oxyg tube is placed in the patient's mouth. He is instructed to breat normally but through the mouth. He is cautioned to lie absolut still. The breathing of oxygen continues for about five minutes.

trial test is generally taken, and the test may be repeated to establish a true recording.

## *ASSISTING THE DOCTOR WITH THE PHYSICAL EXAMINATIONS*

The patient is naturally alarmed at what the physician's examination may reveal, but if he does not enter the examination room in a good psychological condition, he will not be as cooperative and the findings may not be as accurate as the doctor would wish. The nurse can reassure the patient by a simple explanation of why the examination is needed, including what the physician will do and how he will use his equipment and instruments.

Indeed, the nurse will often show the equipment to the patient as she explains its use and purpose.

The nurse will leave a male patient alone with the physician during an examination of the genitals, but she will remain with a woman who is being examined. It will be a great comfort to the woman to know that the nurse will be at her side during the entire examination.

The nurse will check the temperature of the unit to make sure that it is warm enough for the patient. She will see that the lighting is adequate. Not only is good general illumination required, but also a light which can be adjusted to shine over the physician's shoulder and fall directly on the part to be examined is needed. If the patient is not in a private room, screens will be needed to ensure privacy. The nurse may be expected to arrange the instruments and supplies needed for each examination on a tray. Since the physician generally examines the patient from head to foot, the nurse can arrange the tray so that the instruments and supplies to be used can be picked up in the order needed.

Two examinations, in particular, require our attention: the rectal and the vaginal.

### RECTAL EXAMINATION

Enemas are generally ordered both on the day preceding and on the morning of the day of the examination. When, as generally

happens, the physician uses his index finger to make the examination, it is called a *digital examination.* He wears a finger cot or a rubber glove well lubricated to avoid irritation. To enable him to see the condition of the walls of the lower bowel he will insert an electrically lighted instrument, called a *proctoscope.*

The patient will be placed either in the Sims or dorsal recumbent position, described later in this chapter, and will be draped to avoid unnecessary exposure.

## VAGINAL EXAMINATION

If the physician decides to examine the pelvis of a woman, the patient should be relaxed. However, the patient is generally embarrassed and deeply fearful as to what the outcome may be. The nurse can relieve the patient's anxiety to some extent by assuring the patient that a nurse always stays with a woman patient during the entire examination.

Since it is important that the physician see the exact condition of the organs, the perineum is not cleansed immediately before the examination. The rest of the body should be scrupulously clean, and after the examination the area examined should be carefully washed and dried. Sometimes the doctor wishes to see the used pad to judge the amount and character of the vaginal discharge.

The patient is always asked to void just before the doctor sees her, because a distended bladder would interfere with the examination. Sometimes an enema is ordered ahead of time. Under certain conditions, particularly if the patient is unable to void, a catheterization may be ordered.

A good light that falls over the physician's shoulders directly on the area to be examined is required. The patient should be draped so that she can be examined either lying on her back or in the dorsal recumbent position.

## DRAPING

The nurse drapes the patient before he is examined by the physician. The methods of draping may vary in different hospitals. It also varies according to the position in which the patient is placed

and to the examination to be made, but some general principles should be noted

1 All unnecessary exposure of the patient's body is avoided
2 Generally the draping is loose enough to allow for movement of the patient or for change of position
3 The draping must be fastened in place sufficiently so that the draped material will not fall off during the examination
4 The draping is arranged so that the part to be examined is left exposed It should not interfere with the requirements of the examination
5 The patient should be protected from drafts, and should be warmly covered
6 Special draping sheets, jackets, and trousers may be needed for some examinations
7 Sometimes the examination requires almost complete exposure
8 If the patient is not in a private room, he should be screened to ensure privacy

## ASSISTING WITH EXAMINATION OF INFANT OR CHILD

To examine a child who is either unwilling or unable to cooperate it is necessary to restrain him either completely or partially Whenever restraints are applied, they should be put on gently in order to prevent him from thinking that he is being punished for something Talking quietly and understandingly to the child during the process of restraining him also affords him some sense of reassurance, for your voice indicates to him how you feel about having to restrict his activities

Mummy restraint (complete restraint)

*Equipment*

Small sheet    Safety pins

*Procedure* Spread a sheet crosswise on the examining table or bed Place the infant in the center of the sheet Bring one end of the sheet snugly over one arm and leg and tuck it under the body on the opposite side Restrain the other arm and leg in the same manner Tuck the excess length of sheet under the child Pin the sheet so that it will remain snug

**Mummy restraint (partial restraint)**
*Equipment*

Small sheet    Safety pins

*Procedure.* Spread the sheet crosswise on the examining table. Place the infant in the center of the sheet. Bring one end of the sheet over the arm and under the body. Make it snug at the shoulder but allow some slack toward the thighs. Restrain the other arm in the same manner. Fold the sheet across the thighs, and pin.

## POSITIONS OF THE BODY

The positions described below assume that the hospital is equipped with examination tables, but some hospitals may not have these tables or may not have enough of them to examine all patients on them. However, the same positions may be taken by the patient lying in bed, either in the hospital or in the home.

Horizontal recumbent. The patient lies on his back with his knees slightly bent or flexed to relieve the tension of the abdominal muscles. His hands may be crossed on his chest or they may rest easily by his side. He may have a small pillow under his head.

Since the patient may be chilly, partly because of nervousness, he should be covered sufficiently to be warm. A light-weight blanket is generally used for this purpose.

Dorsal recumbent. The patient lies on his back with the legs slightly separated. The knees are flexed and the soles of the feet rest flat on the bed. When the patient is on the examination table, bring the buttocks to the edge of the table and place the feet on the extensions of the table.

This position is used for vaginal and sometimes for rectal examination and when giving some treatments.

Place a folded blanket over the patient's chest.

Place another sheet or blanket lengthwise over the lower part of the patient's body. Turn one corner back over the abdomen. Wrap second corner around the leg and foot nearest you. (The weight of the foot will hold it in place.) Let the third corner fall over the genitals. This corner may be lifted during the examination. Wrap the fourth corner around the other leg and foot.

Dorsal litbotomy In this position—a modification of the dorsal recumbent—the patient's legs are more widely separated and are supported by stirrups

Prone position This position is assumed by the patient for back examinations The patient lies flat on the abdomen with the head in line with the spine, but turned to one side One small pillow is generally placed under the abdomen The legs are extended The patient is likely to be more comfortable if the toes are allowed to extend beyond the edge of the mattress

Sims or left lateral-prone position This position is used for rectal or vaginal examinations

The patient lies on the left side His head is supported by a small pillow The left arm is brought back of the body, while the right arm assumes any position comfortable to the patient The right thigh is flexed against the abdomen, the left is relaxed and flexed less

The draping is similar to that used in the horizontal recumbent position

Knee-chest position This position is considered a beneficial exercise following the birth of a child, and is also used for vaginal and rectal examinations

The patient kneels with his chest resting on the bed or table, his weight is distributed chiefly between his knees and chest, but somewhat supported by his elbows, which may be placed more or less forward, depending on the patient's physique The forearms are extended forward and the lower legs backward

The patient may be draped with either a large sheet with a hole in the center, permitting examination, or by two sheets, one covering the upper and other the lower part of the body When two sheets are used, a corner of the lower sheet may be turned back to allow examination

## ASSISTING WITH DIAGNOSTIC TESTS

As a member of the nursing team, the practical nurse may be asked to help prepare the patient for diagnostic tests Each hospital has its own procedures for the preparation of the patient and for the equipment needed

The nurse always checks on the transportation orders, indicating whether a wheel chair or a stretcher will be used Sometimes she may

be asked to escort the patient to the x-ray room, and occasionally she may be asked to remain with him.

The orders issued in connection with the tests should be followed accurately to ensure the best results. If anything spoils the x-ray pictures the test must be taken again, prolonging the patient's stay in the hospital and increasing his anxiety about mounting hospital expense and the distress of his family while he is away from home.

If the procedure is explained simply to the patient he is more likely to be relaxed and cooperative.

**Gastrointestinal examinations.** The alimentary tract is perhaps the system most commonly studied from x-ray pictures.

Before each of the gastrointestinal tests an enema to cleanse the colon may be ordered given the night before the test. Sometimes another cleansing enema is ordered given on the morning of the test.

Before certain of these tests the patient should fast.

**X-raying the gastrointestinal tract.** Before the alimentary canal can be x-rayed it is necessary to give the patient an opaque substance which will outline the mucous membrane of the tract and thus make it clearly visible when photographed; otherwise the tract would not stand out sufficiently from the surrounding tissue. Barium sulphate is the drug usually given to produce this result. If the upper part of the gastrointestinal tract is to be studied, the barium is given by mouth. It is generally combined with buttermilk to make it easier to swallow. For examination of the colon, the barium is given by enema—known as the *barium enema.* While the barium is being taken, the doctor may examine parts of the gastrointestinal tract through the fluoroscope.

The x-ray photographs are often taken in a series. Unless otherwise ordered, neither food nor drink should be allowed the patient between the tests given on any one day. It is the nurse's responsibility to see that the doctor's orders are carried out strictly. Before a barium enema is given, the patient may be allowed to have a light breakfast.

After the x-ray pictures are taken the barium should be completely excreted. It will show in the stools as white specks. If the barium is not completely excreted at this time, the fact should be reported at once. The doctor may then order cathartics or enemas to accomplish thorough elimination.

If for any reason the barium is not retained in the system until the x-ray pictures are taken, they will be worthless, and the test will have to be repeated from the beginning.

**Gallbladder examination.** If the gallbladder is to be examined, a dye to bring out a clear outline of this organ is given the evening preceding the test. If the dye is vomited, the gallbladder will not show clearly in the photograph. Therefore, the expulsion of the dye should be reported at once to the x-ray technician so that the test may be started again.

**Intravenous pyelogram test.** This is a test made of the urinary tract. The urinary system is prepared for x-ray photography by administering an opaque dye. This dye is either given intravenously or injected through the bladder. Since the bowel must be emptied before this test is given, an enema is ordered. It is essential that any gas in the intestine be expelled; otherwise the gas will cast a shadow on the photograph.

**Chest x-ray.** A chest x-ray is taken to determine whether or not the lungs are as clear as they should be. The patient, with his chest bared, stands before the x-ray machine and holds his breath while the picture is being made.

**Gastric analysis.** When a gastric analysis is to be done, instead of using x-ray photographs, as in the other tests described, a test meal is given, and the actual contents of the stomach are withdrawn both before and after the test meal is eaten.

*Equipment*

| | |
|---|---|
| 1 tray | Rubber bibs |
| Stomach tube in a bowl of ice water | Towel |
| Syringe 20 cc | Celluwipes |
| Rack with test tubes for specimens with labels | Tongue depressors |
| Test meal: material for test meal as ordered | Kidney basin |
| | Spring clothespin |

*Procedure.* Before the meal is swallowed, the doctor passes a stomach tube into the stomach and with a syringe withdraws a sample of the contents for study. Then the meal is eaten. The test meal is withdrawn partially in three portions, at the height of digestion. Samples of the withdrawn material are collected in test tubes and taken to the laboratory for examination. The nurse stands in readiness to assist the physician by handing him the tube and by

keeping the patient as comfortable as possible. Breakfast should be delayed until after the test has been taken.

## *DISCHARGE OF THE PATIENT*

When it is time for the patient to go home, the physician leaves the order for his discharge. The nurse informs the business office so that it may have the bill made up by the time the patient is ready to leave, and the family of the patient is notified so that it may arrange to have the patient taken home.

If the patient insists on leaving the hospital without the doctor's permission, he is required to sign a release showing that he departed against the advice of his physician, thus releasing the hospital from any further responsibility.

The nurse brings in the patient's clothing and valuables; she obtains a receipt from him and adds her signature to the receipt to avoid any possible future misunderstanding. She then assists the patient in packing up his personal belongings, such as books, plants, or flowers, which he wishes to take home. She helps him to dress.

Sometimes the patient is referred to a health agency, such as the visiting nurse association or a rehabilitation center. He may have to report to the outpatient clinic for further check-ups, or the doctor may ask him to call at his office. The nurse makes sure that these matters are fully understood and are covered by adequate memoranda. Directions for medication or for carrying out treatments are usually typed for the patient.

When the mother and her new baby go home, some hospitals provide a 24-hour supply of the baby's formula, and some provide only printed directions for its preparation.

The order book generally gives directions as to the method of transporting the patient to the office—by wheel chair or carrier, if he should not walk. The nurse accompanies him and stands by while his bill is being paid, and until his family or friends call for him.

The patient being discharged is not only treated with courtesy, but he is sent on his way with the same good wishes and promise of continuing interest as if he were a guest. His final impression of the hospital should be even better than his first, for the patient has had

proof of the good service which the hospital renders However, at the time of his departure, all personnel may be working under pressure, and it may require some thought to close the patient s visit to the hospital with genuine consideration and solicitude

## SUMMARY

From the time the patient is admitted to the hospital to the time he is discharged, he should be treated with courtesy and consideration for his preferences The nurse always addresses him by name His personal belongings are kept safe He is given encouragement as well as good physical care

The treatment given depends upon correct diagnosis, which is based on the results of both routine and special physical examinations The doctor gives his orders the nurse follows them

When the patient leaves he should have gathered a good impression of the hospital and the hospital personnel should feel that he has received the maximum benefit from his stay

Temperature, respiration, and pulse are regularly noted and abnormalities are reported Blood pressure is measured as a routine procedure Specimens of urine, feces, sputum, and blood are collected for laboratory analysis Vomitus is saved for the physician's inspection Spinal fluid is removed for diagnostic purposes, particularly if meningitis or syphilis may be present

A basal metabolism test is especially valuable in diagnosing thyroid conditions

Rectal and vaginal examinations require good lighting appropriate draping, and the placing of the patient in the approved position A child being examined may have to be gently but firmly restrained

Diagnostic tests of the gastrointestinal tract, the gallbladder, and the chest employ x ray photographs to visualize the area being studied A substance—barium sulphate for the gastrointestinal tract, and an opaque dye for the gallbladder—is needed to render the organs visible These substances to be effective, must be retained until the photographs are taken but they must be eliminated after the tests are finished

A gastric analysis is made by giving and withdrawing a test meal and by sending samples of the withdrawn meal to the laboratory for analysis.

## Questions

1. Tell how a patient should be treated when he is admitted to a hospital.
2. What becomes of his valuables?
3. How does the nurse avoid any error in identification?
4. How can she reassure the patient before the physical examination?
5. How can she help to make him feel at home?
6. How is heat increased in the body? How is it lost?
7. What is the normal average temperature of the body? How is it maintained?
8. In what two ways does a temperature drop to normal? Discuss each type of fall.
9. What is a clinical thermometer? For what is it especially used?
10. When should the temperature never be taken by mouth?
11. Discuss the aftercare of the thermometer.
12. What can the nurse do to relieve the patient whose temperature is high?
13. What are the characteristics of a normal pulse?
14. What is a very rapid pulse—above 160 per minute—called?
15. What is the effect on the pulse of (a) caffeine, (b) an increase in temperature, and (c) oversecretion of the thyroid gland?
16. How are some qualities of the pulse described? What does each of these designations mean?
17. Define (a) tension, (b) rhythm of the pulse.
18. Describe how to take the pulse.
19. How are respirations (a) normally increased, (b) abnormally increased?
20. How are respirations (a) normally decreased, (b) abnormally decreased?
21. Define (a) dyspnea, (b) stertorous breathing, (c) râles, (d) wheezing, (e) orthopnea, (f) cyanosis, (g) Cheyne-Stokes breathing.
22. To what particular pressure does the term *blood pressure* refer?
23. What is the difference between the systolic and the diastolic pressure called?
24. To what is variation in blood pressure due?
25. Why is the upper arm chosen for taking the blood pressure?

26 What two pieces of apparatus are used in taking the blood pressure?
27 At what point should the level of the column of mercury on the scale be read to record the systolic pressure? Is this the same as *blood pressure?*
28 Be prepared to show how blood pressure is recorded
29 What four tests are usually made after the physical examination?
30 How are specimens labeled? What particular notations should be made?
31 How is a 24 hour specimen collected?
32 How is a specimen collected from an infant (a) male, (b) female?
33 For what six conditions is urine usually tested?
34 What materials—(a) normal, (b) abnormal—may the feces contain?
35 What medication may be given to produce a watery stool so that a semiliquid specimen of feces may be collected?
36 For what qualities is sputum examined?
37 How is the stomach affected by emotional suggestions?
38 What is meant by *lumbar puncture?*
39 Describe the spinal fluid (a) if normal, (b) in meningitis, (c) after a hemorrhage
40 Why is it necessary for the patient to lie motionless while the spinal fluid is being removed?
41 Describe giving a basal metabolism test
42 What are likely to be the duties of the practical nurse when she assists with diagnostic tests?
43 What procedure may be ordered before a rectal examination?
44 What are the general principles followed in a vaginal examination?
45 Describe (a) complete mummy restraint, (b) partial mummy restraint
46 Name and describe each of the body positions discussed in the text
47 Discuss the need of enemas and fasting in preparation for the gastrointestinal test
48 What should the nurse do if the barium used in the gastrointestinal test is not completely excreted after the tests have been given?
49 If the dye used in a gallbladder test is expelled before the x ray photograph has been taken, what should the nurse do?
50 How is a chest x ray made?
51 What procedure is used when a gastric analysis is made? What equipment is needed?

52. Who leaves the order for the patient's discharge?
53. What two groups does the nurse notify when the patient is leaving the hospital?
54. If the patient insists on leaving without the proper permission, what must the patient do?
55. Who signs the list of clothing and valuables when the patient's belongings are returned to him?
56. To what extent does the nurse assist in getting the patient ready to leave the unit?
57. To what places may the patient be referred for further check-ups?
58. Who orders the method of transporting the patient to the office?
59. How long does the nurse stay with the patient at the office?
60. What should be the patient's impression of the hospital when he leaves? How should the nurse and other hospital personnel feel?

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# PART V

## *The Practical Nurse Gives Care and Comfort to the Patient*

# 26

# OBSERVING AND RECORDING THE PATIENT'S CONDITION

The physician depends on the observations of hospital personnel to inform him regarding the condition of his patients. Details are generally hard to remember even for a little while; they would certainly be forgotten by the busy nurse or physician if they were not recorded. Since these details may be vital to the patient's recovery, a constant effort should be made to have them recorded correctly, yet simply, on the various forms which have been designed for the purpose.

Learning to take care of a patient includes the responsibility of observing and recording changes in his condition. In the hospital the head nurse or team leader is always ready to assist the student while she develops the ability to describe what she observes.

A reliable record of the patient has four chief values:

1. It enables the physician to know what has occurred between his visits and thus affords him a sounder basis for his diagnosis. He is able to follow the patient's condition from hour to hour and from day to day.

2. It records all the medication and treatments ordered by the doctor, as well as showing the patient's reactions to them. Well-kept bedside notes reveal what changes in procedures are warranted. For

instance, they show whether or not the patient's activities can be broadened, or whether or not a change in treatment is advisable.

3. It provides an exact history of the patient's illness and the measures taken to relieve him during his entire stay in the hospital. To have such records enables the hospital to render better service. They are very important sources of information when the hospital wishes to find out how frequently certain diseases occur. This information is valuable for compiling statistics for research purposes. In many hospitals the record is preserved on microfilm or kept in a special file that serves as a valuable guide if the patient again enters the hospital.

4. It sometimes is the only reliable account which can be offered in evidence if legal proceedings are brought against the hospital by the patient or his attorney.

Several sheets comprise the patient's record: the medical and social history of the patient, the physical examination, progress notes, laboratory and x-ray reports, the doctor's orders, the intake and output sheet, and the nurse's record sheet. Each sheet may be of a different color so that it can be located and identified easily. These various forms, assembled in a light-weight cover—generally made of aluminum—make up the patient's chart. This is usually kept in a rack at the nurse's station. Although it is accessible to the proper hospital personnel, it should not be read by the patient.

The practical nurse is chiefly concerned with the form for the nurse's bedside notes and the graphic sheets on which are recorded such data as temperature, pulse, respiration, blood pressure, and fluid intake and output.

Methods of charting vary in different hospitals. The nurse is expected to follow the specific practices of the hospital in which she serves.

The record should be printed plainly in small letters and figures, with the words well spaced and the statements clear, concise, and accurate. The signature of the nurse is written in her usual handwriting at the end of each entry. When a mistake is made, she should draw a line through the incorrect words and write in the correct statement, because a record with erasures is ruled out in a lawsuit.

To ensure accuracy, ditto marks are not permitted. Certain abbreviations are allowed but should be used sparingly. The correct date on each day's record is essential. It is not necessary to use the

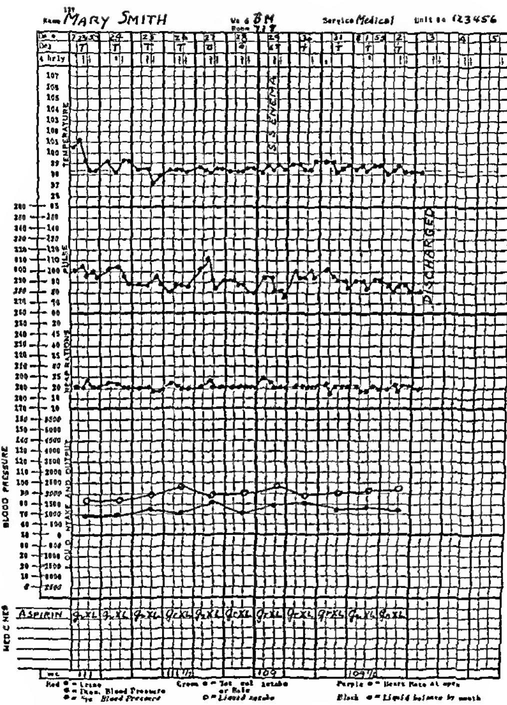


Fig 36 Example of a clinical chart showing information recorded on a hospital patient, diagnosis arthritis

word *patient* on the chart, since it is assumed that the notations refer to him.

In many hospitals black ink is used for charting during the day, and red ink during the night.

Besides recording the temperature, pulse, respiration, and treatments, the nurse must keep a careful record of all medications given,

Date August 3, 1953
Name Mrs. James Gray
Residence 100 X STREET
Attending Physician Dr. John J. Brown
Diagnosis Arthritis

ORDERS
Aspirin Gr X - 4 i.d. Bedrest
Octo-Vitamin 1 capsule b.i.d. p.o.
Nembutal Gr 1½ at bedtime for sleep p.r.n.
Codeine Gr ½ q. 4 hrs. p.r.n. for pain
Hot Wet pack to knees 2 i.d.
High Protein Diet - Bedrest
S.S. Enema p.r.n.
Exercises daily
John J. Brown

Thomas W. Reed Co., Boston

| Hours | Temp | Pulse | Resp | Medicine | Nourishment | Urine | Dej. | Sleep | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| 8 AM | 98 | 80 | 20 | Octo-Vit 1 cap | Orange juice, Oatmeal & Cream, Poached Egg, toast, Coffee | ✓ | | | Slept well. Appetite fair |
| 8 30 | | | | | Water ʒ V | | | | Hot wet packs to knees - 20 min. |
| 9 00 | | | | Aspirin Gr X | Water ʒ V | | ✓ | | Bath. Special care of back |
| 10.15 | | | | | Egg Nog ʒ VI | | | | Physiotherapist came. Exercises |
| | | | | | | | | | Tired after exercises |
| 11:30 | | | | | | ✓ | | ½ hr. | Felt rested after nap. |
| 12: | | | | | Chopped Sirloin, Peas - Squash, Tossed Green Salad, Spanish Cream, Milk ʒ VI | | | | Enjoyed dinner |
| 1 PM | | | | Aspirin Gr X | Water ʒ V | ✓ | | | Physician visited, said pt. |
| 1:30 | | | | | | | | | shows improvement |
| 2:00 | | | | | | | | | Special care of back. |
| 4:00 | 98[illegible] | 80 | 24 | Oct-Vi cap | Lemonade ʒ VI | | | 15 min. | Short nap and rested 2 hours |
| 4:15 | | | | | | | | | Hot wet packs to knees - 20 min |
| 5:00 | | | | Aspirin Gr X | Water ʒ V | ✓ | | | Passive exercises as ordered |
| 6:00 | | | | | Cheese Souffle, Toasted Raisin Bread, Orange Gelatin & Cream, Cookies - Tea | | | | |
| 7 00 | | | | | Water ʒ V | | | | Husband read aloud |
| 8:30 | | | | | | | | | Sponge bath. Special care to back. Prepared for sleep |
| 9:30 | | | | Nembutal gr 1½ | Hot Ovaltine ʒ VI | ✓ | | | |
| Totals | | | | | | | | | |

Fig. 37. Bedside notes for patient at home.

nourishment taken, the excretions, and the amount of sleep In many instances it is necessary to note the amount of liquid taken and the amount of urine voided This information is recorded on the chart under "Intake and Output"

Bedside notes are always arranged with a wide space headed "Remarks" at the right of each sheet In this space is recorded any treatments given and their result, also any unusual occurrence, such as vomiting, chill, pain, or restlessness When recording an enema, the result should be noted—whether the stool was large or small, and the presence of blood or any foreign matter When recording a douche or an irrigation, state whether the water came back clear or cloudy, or containing foreign matter Character and amount of vomitus should be noted Catamenia should be noted, and any distress if present When recording the dressing of a wound, the presence or absence of discharge should be recorded, and the color and consistency described When a sleep producing drug has been given, the nurse should record how soon it takes effect and how long the patient sleeps

The opinion of the nurse has no place in these notes, she merely records what she does for the patient and what happens as a result The physician draws his own conclusions

The physician's time with the patient is limited, therefore he relies on the report given him by the nurse She is with the patient constantly and should notice and report any change in his condition She may not recognize the significance of a symptom, but her report of its appearance may be helpful to the physician in determining the treatment or medication She should record the time and date of the doctor's visit

## *SYMPTOMS*

A *symptom* is any change in the body or its functions indicating disease *or any change* in the disease Symptoms may be divided into those mentioned by the patient (known as *subjective symptoms*) and those observed by the person who is caring for him (known as *objective symptoms*)

Pain, headache, dizziness, chilliness, nausea, lack of sensation in any part of the body, inability to hear or taste, and sensitiveness to

light are all symptoms complained of by the patient. Sleep, fatigue, appetite, temperature, pulse, respiration, condition and color of the skin and expression of the face, position assumed by the patient, inflammation, swelling, perspiration, chills, cough, odor of breath, mental condition, vomiting, vaginal discharge, and anything abnormal in the excretions are all symptoms observed by the person caring for the patient.

## SUBJECTIVE SYMPTOMS

Pain. When the patient complains of pain, the nurse must first try to find out where the pain is. An adult can locate the pain, but children are often very indefinite and may put their hands on their stomach when the pain is really in the head. By watching a child closely, one can usually discover the location of the pain. A baby is likely to shake his head if he has a pain in his ear, or a child will avoid movement which causes him discomfort. (See Chap. 39, "Care of the Sick Child.")

The next thing to find out is the character of the pain, whether it is sharp, dull, or throbbing, or whether it is constant or stops and begins again. Then find out if the pain recurs at certain definite times, such as just after a meal, or if it is increased by coughing or breathing. The nurse should also find out the severity of the pain, by trying to distract the patient's attention; if this can be done, it is safe to assume that the pain is not severe.

Headache, chilliness, and nausea are important symptoms in certain diseases.

Dizziness. Old people are likely to be dizzy because of changes in heart and blood vessels, but dizziness may be due to constipation, eyestrain, or an accumulation of wax in the ears.

## OBJECTIVE SYMPTOMS

Sleep. The length of time a patient sleeps during the day or night should be noticed and recorded. The nurse should not rely on the patient's word, because if the sleep is at all broken he is apt to think that he spent a sleepless night.

Recording the amount of sleep is especially important when any sleep-producing medicine is ordered. Usually the physician orders

the medicine p r n (to be given if necessary) It should not be given if the patient gets sufficient sleep without it

Fatigue is natural after any exertion such as sitting up the first time It should be recorded only when the patient is fatigued without apparent reason

Appetite should be watched to see if it is small or abnormally large Always record the amount of food or liquids taken, not the amount given Notice whether the patient eats with enjoyment or forces himself to take what is offered

*Condition of skin* The color of the skin is often an indication of a change in the patient s condition, and the nurse should notice any unusual pallor or flushing or any unusual color, and whether the color is localized or spread out For instance, in certain cardiac conditions there is a blueness of the skin known as cyanosis, and in jaundice the skin has a yellowish tinge

It should be noticed whether the skin is moist, clammy, or dry, hot or cold

Tenderness or redness in any special area should be noticed and any inflammation or swelling Any eruption or rash should be reported at once

The amount or absence of perspiration should be noticed, and whether it is localized or all over the body

*The tongue* Before physicians had as many precision instruments as they have now, inspection of a patient's tongue formed an important part of their diagnostic procedure The nurse can gain information of value by daily inspection of her patient's tongue while she carries out the usual morning care She should notice the manner in which the tongue is protruded, whether it is dry or moist, whether or not it is coated, any increase or decrease in the coating if present, whether the tongue is smooth and shiny or more than normally "pebbly," and the presence of tremor, thickening, scars, pigmentation, and tooth impressions

Normally the tongue is protruded in the middle line Cerebral hemorrhage, brain tumor, or any condition interfering with the normal nerve control of the tongue muscles will cause it to be protruded not in the middle line but to be pointed toward one side

Tremor of the tongue when it is protruded may indicate damage to the nervous system It is also frequently seen in exophthalmic goiter, in alcoholics, and in very nervous people

If a patient's tongue is moist and shiny along the sides, it is a fair indication that his fluid intake is adequate. If, however, it is dry and dull looking, one can be almost certain that he is not getting or has not been getting enough fluids.

A coated tongue means a toxic patient, and the amount and color of the coating give a rough indication of the severity of the toxemia. It may be due to constipation, to fever, to kidney disease, or to other causes; but, if the coating grows less from day to day, it is a sign that the toxemia is diminishing.

*The throat.* Any difficulty in swallowing or speaking should be reported, also any irritation complained of by the patient.

*The expression* may be dull, overalert and excited, or anxious, pinched, and drawn, which may be serious symptoms. Fatigue is always shown in the face, and it should not be necessary to ask the patient if he is tired.

*Posture.* Patients often unconsciously avoid positions which make them uncomfortable, and the nurse should notice what positions they assume.

A patient with heart trouble usually chooses to sit up in bed, as it is more difficult to breathe lying down; in abdominal pain there is a tendency to draw up the legs, as this relieves the tension on the abdominal muscles. Sometimes a patient will lie on the affected side, as the pressure relieves the pain or makes breathing easier, or in other cases he will lie on the unaffected side in order to avoid pain.

The nurse should notice if the patient lies quietly or is restless and constantly changing his position.

Any loss of function of the legs or arms should be reported immediately.

*Mental condition.* It is very important to observe the mental condition of the patient. Fear, anxiety, and loss of interest retard recovery. The physician should be told if the patient has any delusions or hallucinations. When the patient begins to be interested in his appearance or surroundings and asks to sit up, it is a sign of returning strength. (See Chap. 31, "Care of the Mentally Ill.")

*A chill* may be the first symptom of a disease, usually infectious in character, or it may be a nervous chill; it may be severe and last half an hour, or slight, lasting only a few minutes. The temperature is taken during the chill and half an hour after it is over. There is

no rise of temperature in a nervous chill Record the time, duration, severity, and temperature

**Cough** is a symptom of irritation in the respiratory tract or is caused by nervous irritation Note the character of the cough, whether it is hoarse, convulsive with a whoop as seen in whooping cough, hard or painful, whether or not there is expectoration, and the frequency of the cough The color, odor, consistency, and amount of the sputum should be noticed Always report the presence of blood in sputum

**Breath** Any unusual odor of the breath should be noticed There is a characteristic odor in certain diseases An unpleasant odor may be due to disease of the stomach or to decayed teeth

**Vaginal discharge** Notice if the amount is large, moderate, or small, if blood or mucus is present, or if the discharge has a fecal odor Report if it burns or irritates the skin

**Feces** The character of the feces shows the condition of the digestive organs Normal feces are brown and slightly formed Any abnormal feces should be saved for inspection by the physician The nurse should notice the color, odor, shape, consistency, presence of unusual matter such as blood or mucus, and the number of movements in 24 hours

Involuntary defecation should be reported

**Urine** Normal urine is clear, amber colored, with a slight odor An adult voids about 40 to 50 ounces in 24 hours, a child, 20 to 30 ounces

Urine is diminished by perspiration, small amount of liquid taken, vomiting, diarrhea, disease, and a high temperature

It is increased by much liquid, by drugs, by nervousness

Incontinence, or loss of control of the bladder and rectum, or retention of urine should be reported

A specimen of the patient's urine should be collected as soon as possible on a private case, as the physician will usually wish to examine it He may also request measurement of the amount of the liquid taken and the amount of urine voided This is charted as "intake" and "output"

**Vomiting** The color, odor, consistency, and character of the vomitus should be noted, also the frequency and whether, after vomiting, the pain or nausea is relieved

## IN THE HOME

In the private home the patient's daily record is kept by means of bedside notes, and sometimes a clinical chart is necessary. These forms are available in surgical supply houses and drugstores.

The bedside notes are for the physician's information and may cause unnecessary anxiety if read by the patient or a member of his family. It is always advisable to write the notes in privacy and to keep them in your suitcase or the dresser drawer provided for your use.

When a nurse goes to a new patient, she should carefully observe his appearance and general condition. Unless she does this, she will not recognize a slight change which might lead to something serious.

The first bath may be made an occasion to observe the condition of the skin, but the patient should not be made conscious of this observation.

Report any symptoms, no matter how slight. Cures are possible in the early stages of a disease and, if neglected, it may be too late to remedy the condition. For instance, cancer conditions are curable if a visit is made to the physician or clinic when the first symptom is noticed.

Ask the physician for what symptoms you should watch, especially when giving medicine with which you are not familiar.

Never be afraid to ask questions. You will be considered more reliable if you are willing to acknowledge that you do not know everything.

## *SUMMARY*

The physician depends upon the observation of hospital personnel to inform him regarding the condition of his patients. Since details are easily forgotten, they should be recorded, correctly and simply, on the several varicolored sheets which comprise the patient's chart.

A reliable record has four chief values: it tells the doctor what has occurred; it records medication and treatments; it provides an exact history of the patient's illness for future reference; and it is

sometimes the only legal evidence which may be presented in a controversy

Although methods of charting vary in different hospitals, the nurse's records should always be printed in small neat characters, the nurse's signature should be written in her customary manner. Erasures are forbidden

The nurse should record temperature, pulse, respiration, treatments, medication, nourishment, excretions, sleep, the amounts of liquid taken and urine voided, under "Remarks" she should record unusual symptoms

Symptoms are classified as either subjective or objective Some important subjective symptoms include pain, headache, dizziness, chilliness, nausea, lack of sensation in any part of the body, inability to hear or taste, and sensitivity to light Some objective symptoms are sleep, fatigue, appetite, temperature, pulse, respiration, condition and color of the skin, expression of the face, position assumed by the patient, inflammation, swelling, perspiration, chills, cough, odor of breath, mental conditions, vomiting, vaginal discharge, and abnormal excretions

In the home the nurse should begin her observations at once, so that she may be better prepared to note any changes in the patient's condition and that she may possibly bring a diseased condition to the notice of the physician in time to effect a cure She should ask the physician what symptoms to look for, especially if she is not familiar with the usual effects of the medication to be administered

## Questions

1 Discuss the importance of noting and recording details of the patient's condition
2 Name some of the sheets which comprise the patient's chart
3 To whom should the record be (a) accessible, (b) inaccessible?
4 Discuss the use of (a) ditto marks, (b) abbreviations, (c) the date, (d) the word *patient*, (e) the color of ink used
5 Under what heading is recorded the amount of liquid taken and the amount of urine voided?
6 What facts should be recorded concerning (a) an enema, (b) a douche, (c) vomitus, (d) the dressing of a wound, and (e) a sleep-producing drug?

7. In general, what two things does the nurse record? What about recording her opinions?
8. Define: (a) *symptom*, (b) *subjective symptom*, and (c) *objective symptom*.
9. How can a nurse find out where a child feels pain?
10. What are some characteristics of pain?
11. What are some causes of dizziness?
12. When is a record of the amount and kind of sleep especially important?
13. When should fatigue be recorded?
14. Discuss observations of appetite.
15. What conditions should be noted in making a record of the appearance of the skin?
16. Regarding the tongue, discuss: (a) inspection, (b) condition, (c) protrusion, (d) tremor, (e) indications of adequate intake of liquids.
17. What symptom relating to the throat should be reported?
18. What qualities of expression have significance in illness?
19. Name some positions taken unconsciously which may reveal abnormalities.
20. What enlightening observations may be made of mental conditions?
21. Discuss a chill as a symptom.
22. What qualities of a cough are worth noting?
23. What may be the cause of unpleasant odor of the breath?
24. What characteristics of a vaginal discharge should be recorded?
25. What facts are recorded about the feces?
26. How is the amount of urine diminished? How is it increased?
27. Where should the nurse in the home keep her "nurse's notes"?

# 27

# GENERAL CARE OF THE PATIENT

Nursing care often includes special procedures for unusual conditions but it is built on the daily performance of routine duties, with an understanding of human nature, a desire to be of service, and the skill which comes from the repetition of approved techniques.

The nurse needs to know the patient's background and enough of his history to realize the purpose of the care she is to give him and the extent to which he needs or can benefit by her explanations of procedures. Although the basic procedure has a firm foundation in common sense, scientific principles, and wide experience, the physician may see fit to modify it as he determines the individual's requirements.

If the nurse knows the principles underlying the procedure, she can easily adapt her nursing care to the variations she may encounter in any hospital or home where she is on duty.

During illness cleanliness is especially valuable in promoting comfort and recovery. The patient is suddenly more or less helpless; acute illness intensifies his needs. Yet, as early as his condition permits, he is encouraged to attend to his own personal care. The nurse is alert to assist as needed, and she makes sure that he is provided with the proper equipment ready to use and the supplies that are required.

## MORNING AND AFTERNOON CARE

The term morning and afternoon care as used in the hospital covers a number of hygienic procedures. The purpose of morning care is to refresh the patient after a night which may have been restless and uncomfortable. The afternoon and evening care are designed to induce sleep and to make the patient as comfortable as possible for the night.

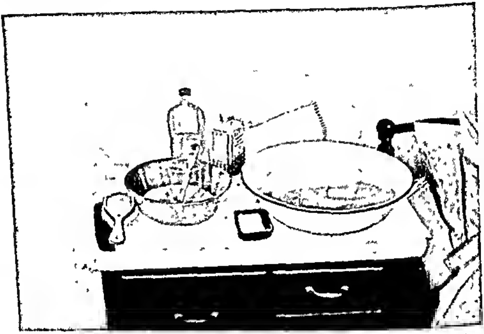

FIG 38. Home equipment for bedside care. (Courtesy of Medichrome-Clay-Adams, New York, and the Visiting Nurse Association of Brooklyn )

Morning care involves giving the bedpan to the patient, bathing face and hands, arranging the hair, brushing the teeth, and removing extra blankets and anything else used during the night. As far as the patient is able, he will attend to his own toilet care. Some ambulatory patients will have part of their toilet care at the bedside, so as to conserve their strength.

*Afternoon care.* Late in the afternoon the patient is fatigued and needs to be refreshed before the evening meal. The combination of certain routine measures for cleansing and relaxing the patient is generally called afternoon or early evening care.

This care includes giving the bedpan, washing the face and nds, general mouth care, brushing the hair, and rubbing the tient's back

The ambulatory patient will take care of his own toilet in the throom, but the nurse sees that he has the proper equipment

*In the evening*, place an extra blanket at the foot of the bed, ady to be drawn up if needed Bring a pitcher of water and a ean glass and place them on the bedside table within reach of the itient Be sure that the electric bell is at hand Remove any articles ed during the day which will not be needed at night Pull the indow shades See that the room is well ventilated and that the atient is screened from drafts

To give the bedpan The introduction to hospital environment in many ways a bewildering experience One element is the lack f privacy in a unit of two or more beds The patient naturally eels embarassed when he must use the bedpan or urinal, although he curtains drawn around the unit or screening the bed affords ome privacy An explanation of the need of regular elimination ind its importance during illness helps the patient to accept his lependency in this situation

*Equipment*

Bedpan and cover
Toilet paper
2 towels
Soap
Basin of warm water

Warm the bedpan by running hot water over and in it, pour off water, and dry outside of the pan Cover with rubber and cloth and bring to bedside with toilet paper and extra towel

Place bedpan on a straight chair or on lower shelf of bedside table Put screen around bed

Place rubber covered with towel under patient If patient is unable to help himself, flex his knees place one hand under the buttocks, and raise him slightly, slip bedpan under him with the other hand Be sure that patient is comfortable on the pan

If the patient is very thin or the skin is delicate, a soft pad or rubber cushion should be placed on the bedpan

Wipe patient dry and clean with toilet paper if he is unable to do it himself Remove bedpan by slipping one hand under buttocks,

withdraw bedpan slowly and carefully with the other hand to avoid spilling the contents. Cover pan and carry it to lavatory. Always observe contents before emptying. Rinse pan with cold water, then with hot, or sterilize, if this is part of the hospital routine. Put pan and cover in proper place.

If patient has used toilet paper himself, he should be given the necessary equipment to wash his hands.

It may be necessary to use soap and water to cleanse the patient after defecation. In this case, turn patient on side; protect bed with towel. Bring basin of warm soapy water, compress cloth, or special washcloth. Wash parts and dry with bath towel.

To give a urinal to a male patient, slip it under the bedclothes as unobtrusively as possible. Screen the bed. Cover witb towel or bedpan cover when bringing it to patient or removing it.

Consult order book before emptying the contents of a bedpan or urinal, as a specimen may be required or it may be necessary to measure the amount. All contents should be carefully observed and anything unusual reported.

A specimen of urine is usually required for laboratory examinations. Specimens of feces and sputum may also be required.

To wash the face. Arrange pillows so that the patient is comfortable and, if a back rest is allowed, put him in a sitting position. Place the towel across the patient's chest. Bathe his face with clear warm water. First wash the eyes gently outward from the nose. Dry witb a towel. Use a different corner of the facecloth for each eye. Apply soap to the facecloth and wash the face, ears, and neck separately. Be sure to wash close to the hairline and wash and dry carefully behind the ears. Rinse and dry carefully with a face towel. Wring the facecloth so that it will not drip, and gather the corners up in your hand so that it will not drag across the skin.

To wash the hands. Spread the towel under the farther arm, so that it will extend below the finger tips. Place a basin on the bed so that the patient's hand may be comfortably immersed. Wash well with soap and water. Remove the basin. Dry the hands, especially between the fingers, with the towel. Rearrange the towel under the other arm and proceed in the same manner.

Care of the mouth. Besides having the patient clean his teeth at least twice daily, morning and evening (unless he is under special

treatment for infection), the mouth should be inspected frequently, inside and out

The nurse is watchful to detect any sores in the mouth and to report them to the physician. When the patient has run a high temperature, even for a short time, the inside of his mouth will become dry and uncomfortable, and the lips will become parched and tend to crack unless they are kept soft by applying cold cream, glycerin, liquid petrolatum, or petroleum jelly. Frequent mouth care is essential to combat the entrance of disease-producing bacteria through the mouth.

*Equipment*

| | |
|---|---|
| Toothbrush | Kidney basin |
| Dentifrice—mouthwash | Cotton swabs |
| Glass of water | Towel |
| Paper bag for waste | Drinking tube |

*Procedure if patient is able to assist.* Assist patient to a comfortable position. Adjust head rest and arrange pillows. Place towel over chest, protecting the gown and bed linen and arrange equipment conveniently for the patient to use.

*Procedure for helpless patient.* Turn patient with his head facing you. Protect the pillow with a towel. Place basin close to the patient's cheek. Apply dentifrice to the dry toothbrush, then brush the patient's teeth using a rotary motion on the outer and inner surfaces. Brush crosswise on grinding surfaces. Give the patient clear water or mouthwash through a drinking tube. Have him rinse his mouth thoroughly and hold his head while he lets the water run out into the basin. Repeat until the mouth is clean. Wipe the lips and around the mouth with a dry towel. Apply cold cream to lips.

**Care of dentures.** Patients wearing dentures are likely to be sensitive about them. Embarrassment is prevented by tact and thoughtfulness. The nurse should remember that dentures are expensive, easily broken or misplaced. She is responsible for them while caring for the patient. When not in use the dentures should be placed in a covered receptacle containing fresh water or an alkaline mouthwash. Avoid using hot water, because it changes the shape of dentures made of certain materials. The receptacle should be kept in a safe place in a drawer of the bedside table. It should be labeled

The dentures require cleaning after each meal and at bedtime. The nurse should always handle them with tissue or gauze.

*To clean dentures.* Let the patient, if he is able, remove the dentures with tissue. Put them directly into a basin of water held upon the bed, to prevent accidental dropping. Take the basin to the bathroom. Grasp the denture firmly while brushing it under running water. Clean it thoroughly with dentifrice. Dentures are easily scratched by the careless use of abrasive materials. The metal clasps on partial dentures require careful cleaning. Place the denture in a basin, cover with water, and carry to the patient. Have him rinse his mouth several times before replacing the dentures.

If improperly fitted, dentures may press on the soft tissues and, as a result, the irritation may develop into a serious condition. Inspect the mouth frequently and report any inflammation or sore spots.

Special mouth care. When the patient is very ill, special care must always be given to the mouth. It should be given every four hours, or, in severe cases, every two or three hours.

Fever may cause the lips to become dry and parched. To prevent cracking and soreness, it is well to apply frequently liquid petrolatum, petroleum jelly, ointment with a lanolin base, or an ointment prescribed by the doctor.

Continued high temperature, reaction to certain medication, and the residue from foods and liquids may cause *sordes* which may be prevented by frequent mouth care. Sordes is a white furry substance which first appears on the tongue and, if neglected, spreads over the entire inner surface of the mouth. It is most painful and irritating and may cause infection.

Any unusual conditions of the lips or mouth must be reported promptly to the doctor or head nurse.

*Equipment*

Tray
Tongue depressor
Cotton swabs
Celluwipes
Forceps
Paper bag
Curved basin
Towel
Liquid petrolatum or ointment for lips
Jar of glycerin and lemon juice (or prescribed medication)
Gauze sponges
Small rubber sheet
Glass with mouthwash or antiseptic solution

*Procedure* Arrange patient as for general mouth care with rubber sheet and towel under chin and basin close to cheek Take up gauze with forceps, moisten it with antiseptic solution Hold mouth open with tongue depressor and gently swab outer and inner surface of upper teeth and gums Discard sponge in paper bag Then in the same manner swab the lower teeth and gums, the inner surfaces of the cheeks, roof of mouth, and tongue Use a clean sponge for each new area and discard the soiled sponges Have the patient rinse the mouth thoroughly with antiseptic Wipe around the mouth with Celluwipes With cotton swabs apply liquid petrolatum to the surfaces of teeth, mouth, and gums as described above Apply the ointment to the lips

Care of the nose. The nose needs special attention during illness The nasal secretions may become dry and stick to the membranes The nostrils should be inspected frequently and any bleeding or unusual condition should be reported to the head nurse Liquid petrolatum or petroleum jelly applied with a cotton swab to the nostrils will soften the secretions Cleanse with a swab dipped in liquid petrolatum or warm water Discard swabs in paper bag that is to be burned

## CARE OF THE HAIR

**Care of female patient's hair.** Have patient's face turned away from nurse Place towel lengthwise at side of patient's head and extend it over her shoulder Part her hair in center from forehead backward Brush and comb and, if the hair is long, braid one half before beginning the other Begin to comb at end of hair and work upward If there are tangles, hold the hair firmly between the head and the tangles while combing If hair is much matted, alcohol will help to remove snarls If patient is weak, do not attempt to comb out all snarls at one time

**To give a shampoo to patient in bed.** The purpose of giving a shampoo is to cleanse the scalp and hair and to make the patient comfortable However, before giving the shampoo, the physician's permission should be obtained, as, under some conditions, a shampoo might be unsafe for the patient The room should be warm and the patient should not lie in a draft

*Equipment*

| | |
|---|---|
| Rubber sheet or Kelly pad | Newspapers |
| Rubber pillowcase | Pail or foot tub |
| 4 turkish towels | Liquid soap |
| Dressing or face towel | 1 pitcher of soap solution, 105°F. (40.5°C.) |
| 2 pledgets | 2 pitchers of fresh water, 115°F. (46.1°C.) |
| Safety pins | 1 washcloth |
| Bath blanket | |

*Procedure.* Prepare the pitcher of soap solution, at a temperature of 105°F. (40.5°C.). Collect the equipment and carry it to the bedside table. Cover the pillow with the rubber pillowcase. Place the pail by the head of the bed. Move the patient, lying on his back, to the near side of the bed and make him comfortable. He should feel secure. Place the rubber-covered pillow under the shoulders. Roll a bath blanket over a long strip of gauze bandage or string and tie the ends of the bandage or string to form a semicircle or basin. Cover the rolled blanket with the rubber sheet, place under the patient's head, letting the ends of the rubber sheet fall over the edge of the bed into the pail, thus forming a drain. In the hospital if a Kelly pad is available, it may be used in place of the rubber covered blanket.

Put a small cotton pledget into each ear. Give the patient a folded towel to place over his eyes. Pin a folded turkish towel around the patient's neck, using half of it to protect the upper part of the bed.

Gradually pour half of the soap solution over the patient's head and make a lather; massage with a circular motion, using the finger tips, and go over every part of the scalp and hair. Wash all around the edges of the face and neck with a well-soaped washcloth to remove any dust or dirt. Use the pitcher filled with fresh water, by now somewhat cooled, to rinse the head and hair thoroughly.

Repeat the process of soaping with the other half of the soap solution, and again rinse the head and hair thoroughly, using plenty of rinsing water.

Squeeze out the hair and gather it into a dry turkish towel. Remove the rubber sheet carefully so that the water will not run out over the patient or bed. Wipe well around the edges of the face, neck, ears, and hair. Place the patient in a comfortable position, and dry the hair with a heated towel. If a hand electric drier or an

electric heater is available, the procedure can be hastened The hair must be thoroughly dry Remove the rubber pillowcase and the protecting towels Comb and arrange the hair

Clean and return all equipment to its proper place

If the patient is able to move, he may lie with his head at the foot of the bed The rubber covered blanket roll can be arranged over the footboard, and the nurse will have greater freedom of movement The rubber sheet fits into the pail or foot tub, making it very simple to carry out the procedure while lessening the strain

To give a shampoo when the patient can sit up When the patient can sit up, the shampoo may be given in the bathroom, over the basin The shoulders should be protected with the rubber sheeting and a bath towel, and a folded towel placed over the edge of the basin The patient can rest his forehead on the towel, or sit with his back to the basin and rest the back of his head on the towel Proceed as though giving a shampoo to a patient in bed

During the shampoo the nurse should avoid tiring the patient She is careful to avoid allowing any water to drip on the patient's face while she is pouring from the pitcher Adding the juice of a lemon to the rinsing water will help remove soap An easy method of rinsing is to use a bath sprayer attached to an irrigating can The nurse may avoid strain to herself by maintaining good posture, bending, when necessary, from the hips

Care of the hair if pediculi are present Always examine for pediculi when combing a hospital patient's hair for the first time Do not let the patient suspect that you are doing this, as it might hurt his feelings

Signs of pediculi are itching of the head, scratched areas on the scalp, nits on the hair, enlarged lymph glands behind the ears and extending to the neck, and sometimes lesions on the neck There is always danger that the scratched areas may become infected The pediculi spread rapidly from person to person by clothing and bedding

*Equipment*

Screen
Rubber pillowcase
Fine comb
Kidney basin containing larkspur or other parasiticide
Absorbent cotton
Safety pins
2 dressing towels
Paper bag

*Equipment*

Rubber sheet or Kelly pad
Rubber pillowcase
4 turkish towels
Dressing or face towel
2 pledgets
Safety pins
Bath blanket
Newspapers
Pail or foot tub
Liquid soap
1 pitcher of soap solution, 105°F. (40.5°C.)
2 pitchers of fresh water, 115°F. (46.1°C.)
1 washcloth

*Procedure.* Prepare the pitcher of soap solution, at a temperature of 105°F. (40.5°C.). Collect the equipment and carry it to the bedside table. Cover the pillow with the rubber pillowcase. Place the pail by the head of the bed. Move the patient, lying on his back, to the near side of the bed and make him comfortable. He should feel secure. Place the rubber-covered pillow under the shoulders. Roll a bath blanket over a long strip of gauze bandage or string and tie the ends of the bandage or string to form a semicircle or basin. Cover the rolled blanket with the rubber sheet, place under the patient's head, letting the ends of the rubber sheet fall over the edge of the bed into the pail, thus forming a drain. In the hospital if a Kelly pad is available, it may be used in place of the rubber covered blanket.

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Gradually pour half of the soap solution over the patient's head and make a lather; massage with a circular motion, using the finger tips, and go over every part of the scalp and hair. Wash all around the edges of the face and neck with a well-soaped washcloth to remove any dust or dirt. Use the pitcher filled with fresh water, by now somewhat cooled, to rinse the head and hair thoroughly.

Repeat the process of soaping with the other half of the soap solution, and again rinse the head and hair thoroughly, using plenty of rinsing water.

Squeeze out the hair and gather it into a dry turkish towel. Remove the rubber sheet carefully so that the water will not run out over the patient or bed. Wipe well around the edges of the face, neck, ears, and hair. Place the patient in a comfortable position, and dry the hair with a heated towel. If a hand electric drier or an

*Procedure* Screen patient if the procedure is carried out in an open ward

Remove cotton pillowcase and put a rubber case on the pillow

Fold a towel in half Place under the patient's head, pin around patient's neck (This prevents the lice from escaping )

The patient should close his eyes and hold a folded towel over them to prevent the solution from getting into his eyes

Using a piece of absorbent cotton dipped in the solution, saturate scalp and hair near the scalp with larkspur or other preparation

To make cap, bring folded edge of towel over top of head to the forehead, fold back edge of towel to prevent covering the eyes At each side of the head, lap the back half of towel over the front half Pin neatly in front of the ears with three safety pins on each side so that the patient will not lie on the pins All hair must be tucked in under the cap Leave cap on for at least six hours A cotton pillowcase is put over the rubber case after towel has been adjusted

When removing cap, be careful not to allow lice to scatter over patient and bed

Comb hair with fine toothed comb to remove dead lice Remove lice from comb with toilet paper and place in paper bag There is a special comb on the market with which lice can easily be removed One can be improvised from a fine toothed comb by fastening six teeth together with a small elastic band This prevents the lice from slipping through

Procedure for ridding the hair of nits There are several preparations on the market which will rid the hair of both lice and nits Directions for use come with the preparation The nits or eggs which cling tightly to the hair are coated with a gelatinous substance which larkspur or other preparations cannot penetrate Therefore, after the lice are killed, the hair must be washed in hot vinegar to rid the hair of nits

*Equipment*

Kidney basin containing hot vinegar
Gauze compresses

Remove cotton pillowcase, put on rubber case Spread hair out on rubber Dip compress in hot vinegar and rub nits off hair, take a few strands at a time When the patient is not in bed, this can be done with his head bent over a bowl

Follow treatment with shampoo.

Everything used in this treatment must be soaked in an insecticide such as Lysol, 2 per cent, or carbolic acid 1:40, before putting away.

Soak comb (and brush if used) in ammonia water.

As pediculi are often carried on the hat worn by the patient, insecticide powder should be applied to the surface of the hat. (Some patients have an unfavorable reaction to this powder.)

After giving the treatment, the nurse should be careful to disinfect her hands. As a precaution she should fine-comb her own hair. While giving the treatment, she must be careful about touching her face or hair with her hands.

To remove and destroy body lice. Sometimes a patient will be found with body lice, inhabiting either the skin or the hairy areas of the body, sometimes indicated by scratches. They may be discovered in the underwear, particularly in the seams, while the patient is undressing. If so, his clothing should be placed on newspapers spread on the floor, and carefully wrapped at once. Some of the clothing may be laundered, the rest should be treated with sulfur. Since lice are acquired from others, great care must be taken to prevent th[illegible] read.

Alth[illegible] should not be embarrassed by the nurse's attitude [illegible] nitted to get up or walk around the unit until th[illegible] troyed. Soap and water will not remove these v[illegible] cation should be used until ordered by the ph[illegible]

F[illegible]

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After giving the treatment, the nurse should be careful to disinfect her hands As a precaution she should fine comb her own hair While giving the treatment, she must be careful about touching her face or hair with her hands

To remove and destroy body lice Sometimes a patient will be found with body lice, inhabiting either the skin or the hairy areas of the body, sometimes indicated by scratches They may be discovered in the underwear, particularly in the seams, while the patient is undressing If so, his clothing should be placed on newspapers spread on the floor, and carefully wrapped at once Some of the clothing may be laundered, the rest should be treated with sulfur Since lice are acquired from others, great care must be taken to prevent their spread

Although the patient should not be embarrassed by the nurse s attitude, he cannot be permitted to get up or walk around the unit until the lice have been destroyed Soap and water will not remove these vermin, but no medication should be used until ordered by the physician

*Equipment*

Bichloride of mercury tablets
Mercury unguent 33⅓ per cent if ordered
All requisites for the daily cleansing bath

*Procedure* If the patient will consent, the body hair should be shaved Then the daily cleansing bath should be given, followed by a bath using the bichloride of mercury tablets in a solution of 1 part to 2000 parts of water The doctor may order the application of mercury ointment to the hairy areas

The bed linen, towels, and underwear should be changed and the soiled articles sent to the laundry without delay The clothing to be cleansed should be sent wrapped in newspaper to the laundry

An effective agent which destroys the vermin, but not the nits, was developed during World War II. DDT (dichlorodiphenyl-trichloroethane), 10 per cent, mixed with talcum powder may be sprinkled over the clothing and on the scalp. It should be removed without delay. Some patients may not react favorably to DDT, and prolonged exposure to DDT must be avoided. DDT is a powerful poison and insecticide. Great precaution must be taken in labeling it clearly, storing it out of reach of children or other irresponsible persons, and discarding containers used in giving treatments. The nurse will follow directions given by the physician implicitly and will assume the responsibility for the proper disposal of articles which have come in contact with DDT.

To rub the back

*Equipment*

- Lotion
- Powder
- Basin or pitcher of hot water
- Patient's towel

Nothing gives greater comfort to a patient who has been lying in bed all day than a good back rub. Warm the lotion by placing bottle in a pitcher or basin of hot water for a few minutes, then bring it to the bedside in the container to avoid chilling and to protect table.

Apply lotion to your hands, then rub rhythmically with long sweeping strokes, working up to base of neck.

Work with the heel of the palm and the heel of the thumb, taking care not to press too hard with finger tips. Dry back with towel. Shake powder from can onto the palm of your hand and apply lightly to the patient's back. Do not sprinkle powder from can on patient's back.

## BATHS

**To give a cleansing bath.** Besides affording the patient a feeling of well-being, bathing removes dirt, dead skin, and perspiration, which, if allowed to accumulate on the skin, produce a disagreeable odor and are favorable for the multiplication of harmful bacteria. Bathing also stimulates the sweat glands, which do not function normally when the patient is inactive.

The ideal time to give a cleansing bath is in the morning, preferably an hour after eating. If a bath is given immediately after eating, the blood goes to the surface of the skin, thus interfering with digestion.

The first bath given a patient affords an opportunity to observe any abnormalities which should be reported, such as eruptions, swellings, and sores of any kind. Whenever you give a bath, notice and report any rash. Check the condition of the skin wherever two surfaces come together, as behind the ears, under the arms, under the breasts, in the umbilicus, between the fingers and toes, and between the groins, as perspiration quickly causes irritation. These parts must be dried carefully after washing. You should also observe and record any red areas on the buttocks or over the bony prominences of the spine, shoulders, or elbows.

*Equipment.*

| | |
|---|---|
| 1 bath basin | 2 washcloths, face and local |
| 2 bath blankets | Rubber or towel to protect table |
| 1 bath towel | Bathing lotion in container of hot water |
| 1 face towel | Nailbrush and toothbrush |
| Soap | Orangewood stick |
| Powder | Glass of mouthwash |
| Brush and comb | Laundry bag |
| Scissors | Changes of bed and body linen |
| Emesis basin | Pitcher of hot water, if necessary |

(One large bath towel can be substituted for 1 blanket.)

Before beginning the bath, see that the room is warm, windows and doors are closed, and the patient is screened from drafts.

*Temperature.* The usual temperature of the water is 110° to 115°F. (43.3° to 46.1°C.)

*Procedure.* Form the habit of collecting equipment and bringing to the bedside in an orderly way as described below.

Put all small articles in the basin, also bottle of back care lotion, which should stand in a container of hot water. Clean linen, blankets, and towels should be laid over one arm. In this way all equipment can be brought in two trips. Do not run back and forth for forgotten articles.

Remove table cover, protect table with rubber or towel, and arrange equipment conveniently. Then bring basin one-third full of warm water at temperature of 110°F. (43.3°C.) If the bath-

room is not near, have an extra pitcher of very hot water to add to bath water when it becomes too cool. Also have receptacle for soiled water. Water should be changed once during the bath.

Loosen all bedclothing. Remove spread, fold it and put it on chair. Remove blankets one at a time, fold, and put on chair. Remove pillows and place on chair. If the patient wishes to keep one pillow, the pillow may be protected by the face towel.

Bath blankets are used to protect the bed from any moisture and to avoid chilling or exposure of the patient. These blankets should be warmed except in summer. Lay bath blanket over sheet. Have the patient hold blanket or, if he is not able, tuck the upper edge under his shoulders. Remove upper sheet, and fold hem to hem, ready to be used for drawsheet. Turn patient toward you on one side. Lay bath blanket on bed with center crease in center of the bed. Bring as high as patient's neck. Lay in folds close to patient's back. Push a little of the blanket under the patient's body. Remove nightgown. This is a simple process in the hospital, as the nightgowns are short and open all the way down the back. Untie at neck and remove one sleeve and then the other.

Turn patient away from you; support, if necessary, with one hand, and with the other reach over and smooth out bath blanket under the patient. Now have the patient lie on his back at the side of the bed nearest you. Place face towel across patient's chest; bathe face with clear water. Bathe eyes first, using different part of cloth for each eye. Remove towel from chest and wipe face dry, one side at a time.

For remainder of bath, use soap on washcloth. Wash each part separately, rinse carefully, and dry. Use firm but gentle pressure Wring washcloth so that it will not drip, and gather up corners in palm of your hand so that they will not drag across patient's skin Wash and dry ears first; do not forget to wash behind the ears.

Spread bath towel under farther arm, uncover arm, and wash entire arm, including axilla. At this point, the basin may be placed on bed so that patient's hands may be immersed. A nailbrush may be used to scrub hand and nails. After drying, clean nails with orangewood stick. If basin is used, remove now to table.

Place bath towel under other arm, and wash arm, axilla, and hand in same manner. Lay bath towel across chest under bath blanket. Hold towel away from chest with one hand, just far enough

to wash under it without exposing patient Wash chest, breasts, and underneath breasts, if patient is female, rinse and dry

Turn towel lengthwise to cover chest and abdomen Bathe abdomen in same manner, taking special pains to clean umbilicus Cover patient with a bath blanket Take basin to lavatory and refill, or discard water into receptacle and refill from pitcher

Turn patient on one side with back near edge of bed Place bath towel well up against back Bathe back and buttocks Rub back with lotion In rubbing, use a firm circular motion on shoulders, hips, and end of spine This is very necessary as a preventive treatment for pressure sores Powder when back is thoroughly dry

Turn patient on back and put on nightgown Slip on first one sleeve of the clean gown and then the other

If the patient is able, it is very refreshing for him to put his feet directly into the basin of water, one at a time, and to allow them to remain for a few minutes

To put the feet in a basin. Draw blanket off farther leg, gather it around the patient's groin in order to prevent exposure Separate patient's feet sufficiently to place basin between them Put foot in basin with both hands, one supporting the calf of leg and one under heel While foot is soaking, put bath towel under upper leg, bathe and dry Then bathe lower leg to foot Foot may be scrubbed with nailbrush Put plenty of soap on washcloth Do not wring, but squeeze soapy water on toes Remove foot from basin to bath towel and dry Dry carefully between toes Clean and cut toenails

Cover leg with bath blanket, and do other leg and foot in same manner

*When feet are not put in basin, wash thigh, legs, and feet as you* did the arms and hands, dry each part before proceeding to next

If able, a female patient usually prefers to take the local bath herself, but the nurse should make sure it is properly done, as it is an important part of the bath Hand the patient a well soaped washcloth and rinse this for her after she has used it, when she has finished, hand her the bath towel Always wash the patient's hands in fresh water after this part of the procedure

When a male patient is able to take the local bath himself, place the towel and basin near at hand and use the time to carry any articles or soiled linen out of the room

Turn patient toward you and fasten nightgown. Gather lower bath blanket and soiled drawsheet against patient's back. Make lower part of bed as taught. Turn patient to clean side of bed. Go to other side and remove lower bath blanket and soiled drawsheet. Then finish lower part of bed and replace pillows. Put on sheet and remove upper bath blanket. Finish upper part of bed. Clean and return all equipment to its proper place. Stock the unit, and see that it is in order.

Bath blankets are folded and kept with patient's equipment. They are changed when necessary.

If a patient is very ill, he should be moved as little as possible. In such a case the lower bath blanket need not be used. Instead, the bed can be protected by using a large bath towel under each part as it is bathed.

Partial bath. As it is important to keep the skin clean, the patient must be bathed every day. But in the hospital, when a complete bath is not given, he has a partial bath.

The face, hands, axillae, back, buttocks, and genitals are washed. Whenever the patient does this himself the nurse sees that the room or unit is warm enough and that the patient has privacy. She brings the equipment, washes the patient's back when he is ready, and gives any assistance needed. She makes the bed and returns all equipment to its proper place. The partial bath is recorded.

A tub bath is given to a patient when it is ordered by the doctor. It is never given when a patient's temperature is above normal.

In convalescence a patient usually has bathroom privileges, but the nurse prepares the bath and renders any necessary assistance. When a patient is able, he may prefer to take his bath alone, but the bathroom door must never be locked, and the nurse must always be near at hand. A mental patient should never be left in the bathroom alone. The bathroom must be warm and everything ready before the patient comes in.

*Equipment*

| | |
|---|---|
| Bath mat | Orangewood stick |
| Bath and face towels | Clean nightgown |
| Blanket or bathrobe | Nailbrush |
| 2 washcloths | Soap |
| | Powder |

*Procedure* It is better to warm the nightgown, towels, and blanket on the radiator to avoid chilling the patient

A chair covered with a towel should be placed near the tub for the patient to sit on while being dried, and a bath mat laid on the floor beside the tub for the patient to step on

Put bathrobe and slippers on patient and, if cool, wrap him in blankets To save the patient's strength, it is better to bring him to the bathroom in a wheel chair As a substitute, a rocking chair may be used Tip chair slightly and pull backward

Undress patient and assist him into tub The face, ears, and neck are washed first then dried Soap arms, chest, and back, and wash with considerable friction Legs, hands, and feet may be scrubbed with a brush The patient will prefer to take the local bath himself

Rubbing is necessary to stimulate circulation and prevent chilliness on leaving bath

Dry carefully, especially between fingers and toes and in creases of body Cover one part of body with large bath towel or blanket while drying other parts

Cut and clean toenails, if necessary Put on warmed nightgown, bathrobe, and slippers, and assist the patient back to bed at once

The bed should be freshly made and warm when the patient is ready to return to it This can be done in a very few minutes before the patient is taken to the bathroom, if all necessary linen and the like are collected before the patient is out of bed He can be made comfortable in a chair during the bedmaking

A warm drink should be given, and then the patient should rest for at least half an hour During this time the bathtub should be washed and dried, soiled towels removed, and all equipment put away The bathroom is left in perfect condition

A shower bath is given only when ordered by the doctor For a shower bath, towels, washcloth, soap, a bath mat, and a clean gown are needed The temperature of the room should be between 70° and 85°F (21 1° and 29 4°C ), warmer than for a healthy person Although it should be well ventilated there should be no drafts The water should be turned on and adjusted for temperature before the patient moves into position under the shower The nurse need not stay in the room continuously, but the door should remain unlocked, and she should be within easy call at

all times. In fact, she should speak to the patient by name and wait for the answer assuring her that everything is all right.

**To shave a male patient.** The comfort and morale of a male patient is promoted by daily shaving, usually in the morning, or as often as necessary. If the patient is too ill to shave himself and a barber is not available, the practical nurse may shave him.

*Equipment*

| | |
|---|---|
| Safety razor | Washcloth |
| Shaving brush | Towel |
| Shaving soap | Shaving lotion |
| Small basin 1/3 full of water | Talcum powder |
| Styptic pencil | Mirror |

(If an electric razor is used, no soap and water are needed)

*Procedure.* Arrange the equipment conveniently at the bedside, with a good light above the patient's head. Reassure the patient, as he is likely to be hesitant about the ability of the nurse to shave him. If an electric razor is used, plug in the cord. Place the towel around the patient's neck to avoid soiling his pajamas or the bedding. Apply the shaving soap or cream to his face and rub it into the pores with a circular motion, to soften the beard. With one hand draw the skin upward until it is taut, and, using short firm strokes, shave downward in the direction in which the hair grows. Rinse the razor frequently in hot water and shake off the excess water. It may be necessary to repeat the procedure if the beard is heavy.

When the shaving is completed, wash the patient's face with warm water to remove the lather; dry thoroughly and apply shaving lotion and dust with talcum.

After use, the razor and shaving brush should be rinsed, dried, and returned to the proper place. Dispose of soiled linen and tissues.

*Points to remember*

1. Remember that the patient often likes to direct this procedure in the way to which he has become accustomed.

2. If the patient shaves himself, arrange a bell or a signal to call the nurse.

3. If a safety razor is used, be sure that the blade is keen and the parts of the razor are screwed together tightly.

4. Hold the skin around the lips and nose taut to minimize sensitiveness.

5 Apply an antiseptic (or styptic) to any minor cuts

6 If the patient shows signs of fatigue, discontinue the process, at least for a while

7 In using an electric razor, follow the directions for use

8 Do not allow a weak or palsied patient to shave himself

9 If the patient is depressed or inclined to be suicidal, a locked razor should be provided

To make an occupied bed. In many hospitals the daily change of linen includes one or two sheets, one pillowcase and a clean spread, if needed

*Equipment*

| | |
|---|---|
| 2 sheets | 1 spread, if needed |
| 1 pillowcase | Binders if required |
| | Laundry bag |

*Procedure* First bring all clean linen to the bedside, place it near at hand on a chair or bedside table in the order in which it is to be used Have a laundry bag ready to receive soiled linen, which should never be thrown on the floor Loosen bedclothes all around bed, always raise mattress with one hand and pull clothes with the other to avoid jarring the patient Remove spread and upper blankets, fold lengthwise, and place on the chair

Place clean sheet or bath blanket over the one that is to be removed If patient is able, instruct him to hold sheet or bath blanket, the nurse, while standing at foot of bed, gently draws out the used sheet Otherwise, hold sheet or bath blanket over patient's chest with one hand while you remove used sheet with the other to prevent exposing patient

The use of a bath blanket is suggested for two reasons

1 To allow the bedding to air for a longer period

2 To prevent unnecessary wrinkling of the clean sheet during the procedure

Fold used sheet hem to hem, then in quarters, ready to use for drawsheet Lay on chair If patient does not object to lying flat, remove all pillows Shake well and allow them to air

Turn patient on his side with his back toward you

*To change lower sheet and drawsheet* Fold soiled drawsheet toward patient so that any crumbs will remain inside Brush any

crumbs off rubber drawsheet with towel and turn rubber drawsheet over patient.

Gather soiled lower sheet in folds as near as possible to patient's body. Lay clean sheet on bed with center crease in center of bed; arrange in folds and push gently under patient's body. Tuck in loose edge, making mitered corners. Draw rubber sheet toward you and tuck in. Take folded drawsheet from chair and lay on bed with center fold as close as possible to patient's body and with selvage on top of fold. Tuck in free end.

If the patient is wearing a binder, place it under his body in the same manner as drawsheet and pull both through together.

Turn patient on his back. Go to other side of bed and turn patient over to side of bed covered with clean linen. Fold soiled drawsheet toward patient and remove carefully so that crumbs will not scatter, and deposit drawsheet in the laundry bag. Draw clean drawsheet from under the patient and turn over patient's body. Draw through clean lower sheet and tuck in tightly with mitered corners. Tuck in rubber sheet tightly, bracing your knees against the side of the bed. Pull drawsheet and tuck in tightly. Turn patient on his back. Shake up and fluff pillows; change the pillowcase and arrange under the patient's head with the clean pillowcase on top pillow.

When lower sheet is not changed, it must be tightened and any crumbs that may have collected brushed off. Be careful to brush away from the patient and toward yourself. This must be done on both sides of the bed.

Place the top sheet, hem wrong side out, over the bath blanket, and while the patient holds the sheet remove the bath blanket or sheet which has been used. Lay bed blanket over the sheet. Have the blanket reach the patient's shoulders. To avoid having the bed-clothing too tight at the foot of the bed, make a box pleat in the sheet and the blankets at the center crease. Tuck in well under the mattress and miter the corners.

Place the spread over the blanket. Fold the top edge of the spread over the edges of the blanket and turn the top sheet over the spread. This protects the blankets and spread. Some patients—those who are irrational, for instance—may require bedsides. These should be adjusted at this time. The patient must not be left without having them in place even for a moment.

## SUMMARY

The ill person, suddenly made more or less helpless, relies on his nurse for cleanliness and attention to his personal needs Routine care is ordinarily given in the morning, in the late afternoon, and before leaving the patient for the night These procedures are supplemented by other care as indicated

Bathing is of prime importance, it includes the cleansing bath, the tub and the shower, washing the face and hands, and other partial baths

Frequent mouth care, including the care of dentures, is required, especially when the patient's mouth is likely to become uncomfortably dry, as in fevers, for instance

The nose needs inspection as well as cleansing, particularly if the patient is helpless

Other procedures considered under general care include giving a shampoo to a patient in bed, care of the hair if pediculi are present, care of the patient with body lice, and shaving the male patient

Making the occupied bed generally takes place after morning care has been given

Although routine procedures are carried out regularly—generally daily or oftener—they are performed with strict attention to detail They offer the nurse a good opportunity to establish a friendly, considerate relation with her patient In fact, they are basic in giving not only general care but total care, the over-all aim of the nurse and the nursing team

### Questions

1 What procedures does morning care include?
2 What procedures are performed in afternoon care?
3 What provision for comfort at night is included in evening care?
4 What can the nurse do to relieve any embarrassment of the patient?
5 Discuss the necessity of giving frequent care to the mouth
6 Describe cleaning the teeth of a helpless patient
7 What special mouth care is given to a fever patient?
8 Describe care of the nose
9 What is the ideal time to give a cleansing bath?

10. Describe the procedure: to put the feet in a basin.
11. What precautions must be taken if the patient has bathroom privileges?
12. What precaution should be taken before the patient steps under the shower?
13. Describe in detail how to give a shampoo to a patient in bed.
14. Why is it necessary to wash the hair with hot vinegar after pediculi have been removed?
15. What are some signs of pediculi?
16. What kind of strokes are used in shaving the face of a male patient?
17. What precautions are taken if a depressed patient is to be shaved?
18. What can a bed patient, who is not helpless, do to assist you to place a clean sheet over the bath blanket?
19. How is the upper sheet placed on the bed so that the hem will be on the correct side when the bed is made?
20. What protection is given to irrational bed patients?

# 28

# SECURING THE PATIENT'S PHYSICAL COMFORT

Good nursing care means meeting the individual person's physical, mental, and emotional needs It means recognizing the patient as a person, as a member of a family group and of the community

To give good nursing care requires knowledge, skill, and thoughtfulness It means care, always and in all ways, for the safety of the patient To prevent disease from being carried to the patient by the nurse, or from the patient by the nurse to other patients, the nurse makes a habit of the proper disposal of waste material and excreta, and of handwashing before and after giving care to the patient In order that there will be no physical injury or mental apprehension on the part of the patient, she supports his body securely and carefully in bed and when he is lifted or moved She places side rails on the bed of the unconscious, disoriented, or eye patient, and on any others who are restless or disturbed, especially at night She uses the correct degree of heat and cold in treatments to prevent burns or gangrene She keeps mechanical equipment in good condition, with particular attention to electrical appliances By observing symptoms closely, and by reporting and recording facts accurately, the nurse becomes the security link between the patient, his environment, and his medical care

The hospital's insurance usually covers injury to the patient caused by an act of any employee. Any such accident should be reported immediately to the head nurse and written up on the specified forms. In the home or in the hospital, the licensed practical nurse is liable for her own acts, and is held responsible for knowledge of the safe carrying out of nursing procedures.

Good nursing care means acting so as to get the desired results from a treatment. The preparation of solutions so that they will have the exact strength and temperature ordered by the physician is an important part of nursing care. To understand how to operate any appliance before using it is essential. A calm confident manner of carrying out a procedure helps in retaining the patient's cooperation.

Enlisting the patient's cooperation in the first place is easier if the nurse is attentive to his needs and wishes in arranging his position for greatest comfort as well as for maintaining good posture. Moreover, if articles in his unit, such as the bell cord, water, light, personal belongings, and the like are easily accessible the patient is much happier. If ventilation, temperature, light, and noise in the unit are adjusted to the patient's needs, he will be readier to accept the nurse's explanation of treatments and procedures. Protecting his privacy by screening and adequate draping is always appreciated.

Poise, confidence, and a tactful bedside manner are signs of good workmanship as much as order and neatness are in carrying out a procedure. Keeping the surroundings tidy during the procedure, and protecting adjoining areas from getting wet or stained simplifies aftercare of both patient and unit.

To save the time and energy of nurse and patient, work can be planned ahead. If equipment is kept complete and in good order it is readily assembled. It should be arranged so as to avoid waste motion. Economy in using supplies and utilities is particularly needful in the home. Finally, the nurse who has made good body posture a habit is saving her own resources and can contribute more to good care of patients.

## *LIFTING AND MOVING PATIENTS*

For any procedures which require lifting, moving, stooping, and bending the nurse needs to know and practice good body mechanics in order to avoid fatigue, back trouble, and other disabilities. She

should concentrate on keeping her back straight and flexing her knees and hips when stooping and bending, until proper posture becomes a habit In like manner she should learn to stand in a balanced position when lifting and moving feet apart, toes pointing ahead, one foot ahead of the other, so that she is balancing on the balls of her feet with the weight of her body on the outer side of the feet In this position she can shift her weight easily by flexing one knee Keeping herself in a balanced position, she can use her leg and thigh muscles in lifting and moving easily and without strain

Lifting does not always require strength It takes skill which the nurse can readily develop once she has made good body mechanics a habit

Since it is often necessary to lift and move very ill or helpless patients, such procedures should be done deftly and gently with as little fatigue to the patients as possible

Patients in the home are never lifted or moved from one bed to another without a definite order from the physician, or, in the hospital, without an order from the supervisor or head nurse

Good posture for the patient is the nurse's responsibility She should see that the patient is placed in good alignment and is well supported, so that his head is comfortably poised in line with his trunk, the natural spinal curves are maintained, the chest is raised and forward, the knees are slightly flexed and, if he lies on his back, the feet are at right angles to the bed If the patient is unable to move about freely, he should be assisted to change his position at least every two hours, with constant attention to head, back, and foot support, to free movement of unimpaired joints, and to maximum ease of chest expansion and deep breathing

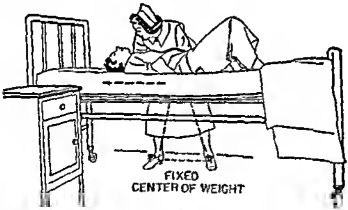
To lift a patient up in bed Stand on the right side of the bed Raise the patient's head slightly with your right hand, slip your left arm under the patient's shoulders and support the head in the hollow of your left arm Put your right arm under the buttocks Draw the patient upward without jerking The patient's head should be bent forward so that the chin rests on his chest, and, if able, he should place one arm under the nurse's armpit and over her shoulder It is a help if he is able to flex his knees and press his heels into the bed

If a helpless patient is very heavy, always get help when lifting, as it is more comfortable for the patient and you are less likely to strain your back Unless the bed is too wide, have your helper stand

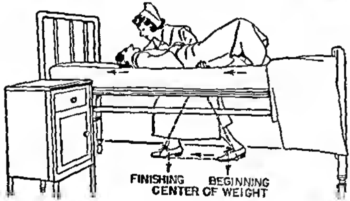
on the opposite side. Place your right arm as when lifting the patient alone, with the left arm under the hollow of the patient's back. Your helper should place one arm near yours under the back and the other under the thighs; then lift together, smoothly and steadily. It is always better to flex the patient's knees, even if he cannot help himself, as it raises the thighs and makes him easier to lift.

To turn patient on side. Slip your left hand under the patient's shoulder and reach through to the farther side. Slip your other hand under the buttocks. Draw patient slightly toward you and at the same time turn him on his side. If the patient is left on his side, place an airfoam pillow, if available, at his back for support.

*To turn patient on his back again.* Roll patient slightly toward you, then go to the other side of the bed and lift patient back to center of bed, in the same manner as above.




*A*

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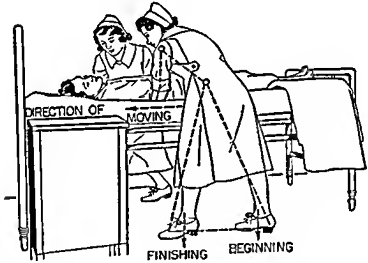



*D*

FIG 39 Assisting the patient up in bed *A* (p 300), poor working body mechanics of nurses, *B* (p 300), good body mechanics, *C*, poor working body mechanics, *D*, good body mechanics (Courtesy of Medichrome-Clay Adams, New York, and by permission from *Body Mechanics in Nursing Arts*, by Bernice Fash Copyright 1946 McGraw Hill Book Company, Inc , New York )

To move helpless patient to one side of the bed. Pass one arm under patient's neck and shoulder and the other under the thighs and draw him toward you Or, to move the patient to the side of the bed, loosen the drawsheet and pull it steadily and slowly toward you These methods are simple when the patient is light and small

If the patient is tall or heavy, you should get someone to help and proceed as described in the instructions for moving the patient up in bed.

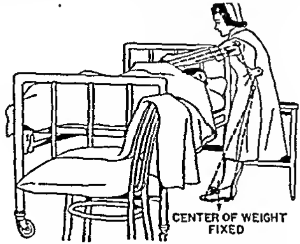
If bedrails are required, be sure to put them back in place before leaving the patient.

To change pillow. Support the patient's head with the left arm, as in lifting him up in bed; raise him slightly and with the free hand remove the pillows. Lay the patient back. Shake pillows and lay on side of bed within reach; draw into place as you lift patient in same manner.

To avoid lifting the patient twice, you can have a fresh pillow ready on a bedside table or the side of the bed and draw it into place as soon as you have removed the used pillow.

To adjust rubber drawsheet. The rubber drawsheet often slips down in the bed from the weight of the patient's body. To adjust rubber, loosen at both sides and make a fold under the patient's knees, so that the lower edge is in proper position. If patient is able, have him raise buttocks in the same manner as in giving bedpan and pull rubber up beyond hip line. Then lift patient's shoulders and finish arranging rubber. If patient is unable to help, a second person is required, and while one supports the buttocks, the other pulls rubber into place.

To help a patient sit up in bed. Hospital beds are adjustable, which makes it very simple to support the patient when he is allowed




*A*

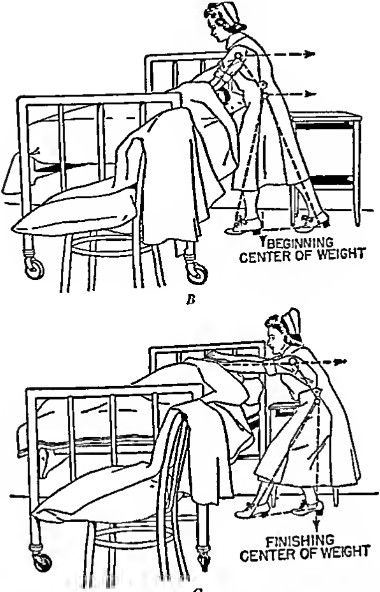



FIG 40 Turning the patient in bed *A* (p 302), poor body mechanics, *B* and *C*, good body mechanics (Courtesy of Medichrome–Clay-Adams, New York, and by permission from *Body Mechanics in Nursing Arts*, by Bernice Fash Copyright 1946 McGraw Hill Book Company, Inc, New York)

to sit up. In private homes it is usually necessary to rely on pillows for support, and their arrangement is an art. It often takes five or six pillows to make a patient comfortable.

A good arrangement is to have one large pillow at the head of the bed for a foundation, with a soft pillow placed on either side,

slanting toward the center. Another soft pillow can be placed across to support the head and small pillows placed wherever needed to fill in hollow places. Put your hand in to find out where support is needed. A simple arrangement is to pile pillows one on top of the other at the head of the bed and place a pillow at each side of the patient to support the arms.

Whenever possible, use airfoam pillows next to the body surface. These are available in various sizes. They help to prevent pressure sores and are less likely to cause perspiration.

If a patient is allowed to sit upright for any length of time, a firmer support may be provided by using an adjustable back rest, which can be improvised in the home by using a kitchen chair placed in the bed, with its legs against the headboard and its back forming an inclined plane.

The chair must be tied to the headboard and a blanket or old spread used as padding to prevent scratching the bed. Many pillows are required to make a back rest comfortable and there must be support at the feet or the patient will be constantly slipping down.

**Dangling.** Before the patient is allowed to get up, the physician usually orders the nurse to let the patient's feet and legs "dangle." This means sitting on the bed with legs hanging over the edge to equalize circulation in the legs.

**To prevent a patient's slipping down in bed.** For the comfort of the patient, it is often necessary to devise some way of keeping him from slipping down in bed, especially when for any reason the head of the bed is raised, as in the case of a heart patient. In the hospital special footboards are available, which are placed between the mattress and the foot of the bed. The upper bedding is then brought up over the board and serves to keep the weight or pressure of the bedding off the patient's feet and legs.

In the home a simple method is to place a hard pillow between the patient's feet and the foot of the bed. If a box is used, it must be padded to make it more comfortable.

Another method is to fold a sheet cornerwise to make a sling. The ends of the sheet can be twisted and tied to the head or side of the bed.

A third method is to lay a sheet diagonally on an empty bed so that one corner is toward the footboard. Place a pillow, protected

with rubber, in center of the sheet Fold sheet over pillow so that the other corner meets the corner at the footboard Fold pillow in middle by laying arm across and rolling pillow over, then roll it to the foot of bed Fold in the corners neatly Twist loose ends of sheet to keep pillow firm and tie to head and sides of bed

In all of these methods the sheet should come under the patient's thighs It is necessary to watch for pressure spots wherever the skin comes in contact with the sheet

**To get a patient on and off a stretcher.** Stretchers are used in the hospital to transport patients to and from operating rooms, and to x-ray and other areas when the patient is hampered by appliances or is too ill or drowsy from medications to be placed safely in a wheel chair It is also convenient to move the patient to a stretcher when it is necessary to turn or change his mattress

Before bringing the stretcher to the bedside, the patient should be told what is being done, where he is going, and why the stretcher is used, as many patients think it is only for transportation to surgery and become needlessly alarmed

Cover the patient with a sheet or bath blanket, and remove the upper bedding or fold it neatly to the foot of the bed If the patient can help himself, bring the stretcher parallel to one side of the bed, and hold it steady while the patient, using his arms and hands to aid in shifting his weight, lifts himself onto the stretcher If he can, it is usually easier for him to assume a sitting position during this procedure.

If the patient is helpless, three people will be needed to move him safely He is first moved to the side of the bed where the stretcher will be placed, with his shoulders well below the top of the drawsheet, which is untucked on both sides The stretcher is then placed parallel with the bed, one person stands beside the stretcher, leans over it, grasps the drawsheet and pulls it evenly toward him *at the same time* that the second person on the other side of the bed reaches over the bed (or kneels upon it) and, grasping the drawsheet, moves the patient toward the stretcher, while the third person, standing at the foot of the bed, lifts the patient's legs and feet onto the stretcher The drawsheet may be left under the patient to be used when moving the patient back to his bed, which is done similarly, in reverse The bath blanket is arranged over the patient, with an extra

blanket, if necessary. The patient is instructed to keep his arms and hands on the stretcher at all times. When the patient is helpless or unconscious, the straps are fastened securely over the blankets.

To move patient from one bed to another in the home. This requires two people. Loosen bedclothes on both beds. Cover patient with a blanket and roll back the bedclothes. Bring the beds close together (they must be of the same height). One persons stands on the farther side of the fresh bed, the other *kneels* on the *side* of the patient's bed, each holding *one* end of the drawsheet. The person on farther side pulls on drawsheet. At the same time the assistant pulls upward on her end of the drawsheet, thus lifting the patient toward the fresh bed. A slow steady pull on the drawsheet will transfer the patient to the fresh bed without discomfort. If the patient is helpless, a third person is needed to support the head and shoulders.

To turn or change the mattress in the home. When the patient is helpless, this requires two persons. When the patient has been ill for some time, the mattress should be turned occasionally from top to bottom, as well as reversed, to prevent sagging in the middle. Besides the discomfort to the patient, sagging interferes with keeping the body in good alignment.

When the mattress becomes soiled or wet with excreta there is a most unpleasant odor. Another mattress in good condition should be substituted for it.

To turn an ordinary or airfoam mattress, loosen bedclothes on all sides, remove the spread and top blanket, fold the remaining blanket and sheet over the patient, then roll under-bedding closely to each side of the patient. Move the patient to the side of the bed.

The assistant then draws the mattress toward her, leaving half of the springs exposed. The bedside table and chair may be used as a prop for the extended half of the mattress. Arrange several pillows on the exposed half of the springs and *draw the patient onto pillows* by pulling the lower sheet toward you. Turn the mattress from head to foot, or substitute a new mattress; then use the lower sheet to draw the patient back onto the mattress.

Remove the pillows from the exposed part of the springs, and pull the mattress until it completely covers the springs. Then move the patient to the center of the bed and remake the bed.

When the mattress has inner springs it is impossible to turn it

from top to bottom while the bed is occupied It can be pivoted and turned if the patient is permitted by the doctor to be moved to a stretcher or to another bed

To get a patient up into a chair

*Equipment*

| | |
|---|---|
| 1 bath blanket | Bathrobe |
| 1 blanket | Slippers |
| 2 large pillows | Stockings |
| 2 small pillows | Pajama trousers |
| Rubber pillowcase | 2 large pillowcases |
| Safety pins | 2 small pillowcases |

*Procedure* Assemble all articles and place them within reach Select a comfortable chair and place it close to the bed, parallel to it, facing the head Drape one blanket over the chair Place a pillow, covered with a rubber pillowcase (if the patient is likely to be incontinent) on the chair Cover the patient with the bath blanket and remove the upper bedding Detach and clamp off drainage apparatus Put on the patient's pajama trousers, stockings, slippers, and bathrobe Note the pulse and respiration before moving the patient

To move the patient into a sitting position in the bed. Face the bed and swing the patient into a sitting position Stand directly in front of him and support him under his arms as you assist him to a standing position on the footstool Help him to step to the floor

Have the patient face you He can usually bear his own weight without putting any strain on the nurse Bend your knees and hips with one foot well forward, lowering your body to the level of the patient when he is seated

Make a half-turn, pivoting the patient into a position from which he can be seated If he is not sitting back far enough for comfort, go to the back of the chair and place your hands under his arms, draw him toward you until he is back far enough

Place a second pillow behind his back and put small pillows under his arms to increase his comfort Cover him sufficiently to keep him warm Do not let him sit in a draft

Take and chart the patient's pulse and respiration Observe him for signs of fatigue and discomfort

Never leave the patient alone the first time he sits up in a chair, and never leave him at any time without a bell or a signal cord

**To get a patient with fractured arm or leg into a chair.** Proceed as above except that a second person must be at hand to support the fractured limb while the patient is being helped into the chair.

**To get a helpless patient into a chair.** Two people are necessary. Get patient in sitting position, with his legs dangling. One person stands at one side with his right arm around the patient's waist, his left arm under the thigh. The patient can then be lifted and swung into the chair. Both workers must be careful to make the same motions at the same time. It will be easier if the patient is able to put his right arm around one person's neck and his left arm around the other person's neck.

**To get a patient in and out of a wheel chair.** To assist a patient into a wheel chair, in general follow the steps outlined in "To get a patient into a chair." However, the patient may be more or less helpless, timid, or feeble. He may require little assistance or he may have to be supported at his back and under his knees before he can be swung into a sitting position. He should be moved gently and slowly.

His condition, as well as his size and other factors, will determine how much, if any, assistance the nurse will need to get him in and out of a wheel chair. She should ask for enough help to safeguard the patient. When more than one worker is needed, the teams acts in unison, carefully timing their slow, smooth movements, and distributing the weight of the patient's body so that it may be borne equally.

In addition to the equipment ordinarily assembled to get a patient up in a chair, a wheel chair, with blocks to keep the chair anchored, will be needed. Check the tires and adjustable parts of the chair to make sure that it is safe and in good order before you wheel it to the patient's bedside. Place the wheel chair at right angles to the bed, facing the head and about two feet from the foot. Drop the leg rests and raise the footrests to get them out of the way. Block the wheels. Arrange the blankets and pillow before getting the patient out of bed.

Seat him in the wheel chair as you would in any chair. Wrap the blanket around his legs and wheel him into a cheerful part of the recreation area. Provide him with a diversion which will interest him.

When the patient is ready to return to bed, the chair should be

wheeled to the bedside Before the patient is moved, the footrest should be lifted and the leg supports dropped so that his feet can rest flat on the floor

At this point the procedure "To get the patient into bed again" may be followed

*Points to remember*

1 Try to conform to the patient's preference as to the time he gets up He will probably enjoy eating a meal or chatting with his visitors while he is out of bed

2 Never try to get the patient into the wheel chair until the wheels are blocked, or someone is holding the chair steady

3 Remember that the patient may get cramped if his position is not changed or his weight shifted, therefore, adjust the back of the chair and the leg rests at different angles and rearrange the pillows from time to time

4 Remember that you and the hospital are responsible for accidents to your patient, so guard him at all times

**To get the patient into bed again** When the patient is ready to return to bed, carefully assist him to his feet If the bed is too high for him to sit on, the footstool should be placed at the center of the bedside at an angle of 45° to the edge of the bed While the patient is still seated, stand close to him, facing him, and put your arms on his shoulders as you gently bend his body forward Then place your hands under his arms, with one of your feet placed behind the other Flex your knee, shift your weight on to the back foot, and draw the patient forward and upward into a standing position

Assist him to step onto the footstool by again supporting him under his arms Pivot him around so that his buttocks are against the side of the bed Place one arm under his knee and the other around his shoulders and assist him gently into a sitting position on the bed Remove his stockings, slippers, and bathrobe Attach any drains to the drainage tubing at the bedside His trousers should be removed, and the bed adjusted to his comfort

Offer him a glass of fruit juice before he settles down to rest

Chart his pulse and respiration and note the general effect of the procedure on the patient

Clean and replace the equipment used Report on any repairs of equipment that are needed

## *FURNITURE AND APPLIANCES*

Certain appliances add greatly to the patient's comfort in the home. They are quite expensive to buy but often something can be improvised which will serve the same purpose.

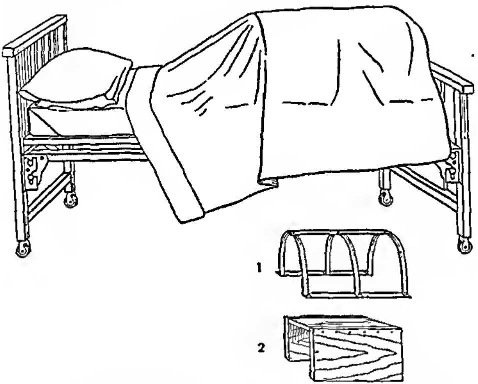



FIG. 41. Cradle in position on bed Inset 1 shows hospital-type cradle, and insert 2 shows improvised cradle. (Based on Todd, Ramona L., and Freeman, R. B: *Health Care of the Family* W. B Saunders Company, Philadelphia, 1946.)

A back rest consists of a wooden or metal frame covered with canvas or ticking that is adjustable to different angles. Ticking is more comfortable than canvas. The back rest provides a firm support against which pillows may be stacked. A lapboard may be substituted, but it must be fastened firmly to the head of the bed. A kitchen chair is another substitute. The method of using it is described in the paragraphs "To help a patient sit up in bed."

In using any type of back rest, do not forget that the patient will constantly slip down in bed unless support is provided for the feet.

Bed tray. A tray for serving meals in bed can be improvised by cutting out the two sides of a heavy cardboard carton. Another type of tray can be made by nailing eight-inch supports on each end of a wide board.

Bedside table. A useful bedside table has the leg on one end, thus leaving the whole top free to be adjusted over the patient's knees.

Bed cradles are used to lift the weight of the bedclothes from some part of the body. They are made of wood or metal and are available in several sizes. They fit across the bed or along the bed lengthwise. One can be improvised easily by cutting out the two sides of a wooden or a heavy cardboard carton. A cradle is used over a fractured limb, burns, and amputations or other operations. Since there is a large air space under the cradle, lightweight coverings may be needed to keep the extremities warm.

Under some conditions the patient would be much more comfortable if the family will hire a Gatch or Hi-Low bed from a surgical supply house. In most cities these beds and wheel chairs, as well as some other appliances, may be borrowed from the loan closet of the visiting nurse association or some other community service. Before buying any expensive apparatus, the nurse should assist the family to investigate the possibilities of borrowing the needed articles. If a long illness is anticipated, an advertisement in a local paper may bring the desired result.

Electric cradles with protected light bulbs are used under certain conditions to supply dry heat. The doctor determines the amount of heat to use.

Footboards are placed between the mattress and the foot of the bed for foot support, to keep the weight of the bedding off the body. To make a footboard at home, nail together two boards from 15 to 20 inches square to form a right angle. The horizontal board fits under the mattress; the upright board, covered with protective material, serves as a foot support and keeps the bedding off the feet.

Sandbags are used to immobilize a broken limb. They should be covered neatly with a dressing towel pinned in place.

Airfoam pads and cushions are available at surgical supply

houses. They are comfortable and are less likely to cause perspiration. Airfoam pillows come in various sizes. The small pillows tuck under the head or elbows, adding to the comfort of the patient.

## *SUMMARY*

Good nursing care means total care—meeting the patient's physical, mental, and spiritual needs. It requires knowledge, skill, and thoughtfulness. Hygiene is practiced to prevent the spread of disease; bedrails are used to guard helpless or disoriented patients; hot and cold applications are made at the right temperatures; mechanical equipment is kept clean and in good repair; and symptoms are observed, recorded, and reported conscientiously, for the nurse is held responsible for the safe carrying out of nursing procedures.

The nurse prepares solutions as ordered; she knows how to run the appliances she uses; she enlists the patient's cooperation; she keeps the room or unit clean and in good order; she is economical with supplies. She employs good body mechanics to save herself unnecessary strain; lifting and moving require skill as well as strength. The nurse awaits orders from the physician before moving her patient from one bed to another.

Good posture for the patient in bed receives close attention. If the patient is helpless, his position is changed frequently to ensure his comfort. If he is heavy or unable to move about, the nurse gets assistance to avoid straining herself and possibly injuring the patient seriously.

The procedures involved in lifting and moving the patient take advantage of the techniques worked out in many hospitals. Those described in the text include: lifting the patient up in bed, turning him on his side, turning him on his back again, moving a helpless patient to one side of the bed, changing a pillow, adjusting the rubber drawsheet, helping the patient sit up in bed, dangling, preventing the patient from slipping down in bed, moving the patient from one bed to another, turning or changing the mattress, getting the patient into a chair, and getting the patient in and out of a wheel chair.

The nurse who puts herself in her patient's place is the one who most willingly does all she can to secure the patient's comfort.

## Questions

1 In what respects is the nurse the security link between the patient and his environment and medical care?
2 What should the nurse do if an accident occurs?
3 How can the nurse earn the patient's cooperation?
4 Why are good body mechanics required in lifting and moving the patient?
5 Describe how to stand in a balanced position
6 What is good posture for the patient, in general?
7 How can the patient who is unable to move about freely be moved?
8 Describe how to lift a patient up in the bed
9 Describe how to turn a patient on his side
10 What precaution is taken to prevent a helpless or disoriented patient from falling out of bed?
11 How can a helpless patient be moved to one side of the bed?
12 How can a patient who is not helpless assist in adjusting the rubber drawsheet?
13 In the home how may pillows be arranged to give adequate support when a patient is allowed to sit up?
14 What are the advantages of using airfoam pillows?
15 How can a back rest be improvised if pillows alone are not used?
16 Define "dangling"
17 What aids can be given the patient to keep him from slipping down in bed?
18 Discuss several devices for keeping the weight of the bedding off the patient's feet and legs
19 Discuss the uses of a stretcher
20 Why is it well to explain the situation to the patient who is going to be transported on a stretcher?
21 If the patient is helpless, how many persons will be needed to move the patient safely to a stretcher?
22 How is the helpless patient made secure on a stretcher?
23 How is a patient moved from one bed to another?
24 How may an ordinary or an airfoam mattress be turned?
25 How does the patient rest while his mattress is being turned?
26 In what clothing is the patient dressed if he is to sit up in a chair?
27 Describe getting the patient into a chair
28 At what points in this procedure is it well to take the pulse and respiratory rate?

29. Describe getting the helpless patient into a chair.
30. How can a wheel chair be "anchored"?
31. What is done to the leg rests and the footrests to get them out of the way while the patient is getting in or out of a wheel chair?
32. How can the nurse prevent the patient in a wheel chair from getting cramped?
33. Describe getting the patient into a standing position from the wheel chair.
34. What does the nurse do for the patient after he has been pivoted into position near the bed?

# 29

# KEEPING THE PATIENT CONTENTED

## *EVERYDAY DIVERSIONS OF THE SICKROOM*

The patient who is very ill is understandably self-centered and withdrawn from his environment. He should not be bothered by attempts to amuse or interest him, for rest and quiet are "good medicine." As soon as he begins to recover he will look around for diversion. He will be interested in all who come within range of his vision. He will be gladdened by gifts, cards, and flowers sent by his friends. He will enjoy a radio turned on to one of his favorite programs. He will welcome visitors who do not tire him, and will be relieved to have others excluded.

As he improves, he will respond to his room, especially if it is bright and cheerful. He will be particular about the angle at which his bed is adjusted when he is ready to sit up. He may ask for a back rest or extra pillows to support him, or a table or work surface of the correct height as he begins to get restless—in a word, he shows he is interested in "something to do."

If he is not likely to remain long in bed, it will be relatively simple to provide for his diversion; but if he faces a protracted illness or is handicapped for life, a long-range plan of keeping him happily oc-

cupied becomes a problem which requires not only the ingenuity of the nurse but the advice of the physician.

The activities of the convalescent range from diversion and recreation to occupations. *Diversion* is turning the patient's thought away from himself—his illness, his personal problems, and his family responsibilities. A simple pastime may be all that is necessary to divert his attention and occupy the hour. *Recreation* involves remaking the patient's point of view, changing his perspective and lifting his mind from the dull level of self-pity to more inspirational heights. Through recreation new vistas are opened and new hope is born. In contrast, *occupations* are purposeful activities which are planned to yield satisfaction.

Each of these three aspects has its time and place. They all call for an outpouring of interest, and, taken as a whole, offer the prospect of attaining happiness through keeping minds and fingers busy.

Since various factors govern the choice of an activity, the nurse will be guided by the physician as to what the patient is best fitted to undertake. Most of the responsibility for putting plans into action, especially in the home, falls upon the nurse. She will see that the patient sustains his interest, makes reasonable progress, and, in general, derives the maximum benefit from the project.

Providing diversion, recreation, and occupation for patients will be an ever-recurring problem. The nurse who realizes what the right activity can do for a patient will be glad to prepare herself so that she can suggest, instruct and direct many projects, some simple and transient, others more complex and enduring. Occasionally she may bring into her patient's life a source of continual, satisfying employment.

## RESOURCES OF THE NURSE

The interested nurse will accumulate manuals of instruction, will become familiar with supplies, will clip and file articles about new arts and crafts, and will examine the things for sale in agencies for the handicapped.

She will probaby be amazed at the wealth of material which can be brought to the bedside. Crossword puzzles and their solutions can

be pasted on loose leaves in a scrapbook, folding paper, as shown in kindergarten textbooks, has many possibilities, silhouettes cut from black paper can prove amusing

The practical nurse can be constantly alert to discover novel ideas, to learn how they may be carried out in available materials Her interest in the therapeutic value of diversions for the sick will surely deepen

## FACTORS INVOLVED IN CHOOSING AN ACTIVITY

The physician's choice of an activity is influenced by several considerations age, sex, manual skill, and mental ability The nurse will be guided in carrying out the project by these same factors, for projects should not only be absorbing for the time being, but should contribute to the patient's recovery

The hobby chosen should not be too expensive for the family to finance Perhaps it will be possible for enough of the finished articles to be sold to purchase new materials, or, better still, to earn some profits for the patient The arts or crafts which find the best market require instruction and training

**Age, as it influences choice.** Very simple materials are all that are necessary to keep contented a very young child or an adult whose illness has slowed his mental processes, provided that the nurse has both imagination and ingenuity Simple materials can keep fingers busy as they work off nervous energy Braiding in various colors may be sufficiently diverting Kindergarten occupations may be more desirable than those requiring greater skill, for some children are older in years than they are emotionally

**Sex, as it influences choice.** The girl or woman is likely to find a wide range of absorbing activities, often centering around the sewing arts Although there is not much difference in the basic interests of boys and girls, some activities have been traditionally regarded as more suitable for girls than for boys, so that the young boy scorns them He, as well as the average man, is likely to be interested in mechanical puzzles, basketry, chair caning, bookbinding, metal crafts, block printing, whittling, wood carving, and other woodworking occupations

Some men, after a little persuasion, have found that knitting,

crocheting, and weaving are comparatively good choices for them, considering their aptitudes and limitations.

*Manual skill, as it influences choice.* Handwork demands manual skills; therefore its use in the sickroom depends first upon the aptitudes and capabilities of the patient. Even the talented ill person may have physical handicaps, so that he cannot carry on certain projects for which he otherwise would be fitted. The average patient will need guidance from one who knows the crafts. In the hospital this responsibility is usually assumed by the occupational therapist. In the home he will look to the nurse. She will have to give him encouragement if he is to remain contented day after day.

To avoid frustration, the work chosen is graded to the patient's level. He will be most happy when he has a well-defined and worthwhile object in view, and if he looks forward to finishing what he has begun. These optimistic attitudes can be fostered by the nurse. She can perhaps help to decide the design, the size, the color, or the material to be chosen—or she can tactfully let the patient make his own choices. She can forestall mistakes which would waste the time of the patient, or she can wait until he sees his mistake and corrects it on his own initiative. She can suggest more complicated variations, or she may feel it best to let the patient enjoy the peace of mind which comes when one feels he is "all set." She can check boredom by allotting only enough material to last a short while, by noting signs of fatigue, and by turning her patient's attention to other diversions—his in-between snack or glass of milk, for instance.

*Weaving.* Weaving ranges from the simplest of projects to one of the most complex. A piece of notched cardboard may be strung with a warp of worsted or colored string and the woof may be woven with a large needle. Using simple looms may be the next step, and weaving complicated designs on larger looms, which may possibly be borrowed from a social agency, may lead to a very satisfying long-range occupation.

If the nurse has already developed an interest and skill in weaving, as a hobby, she will be ready when the physician wishes her patient to undertake weaving as a project.

*Games.* Games appeal to many patients. New games are constantly appearing, which the nurse learns to play as each becomes popular. However, it is the "old standbys"—checkers, lotto,

dominoes, and card games—which are undoubtedly worth learning, because they fit into so many situations and interest so many people in different walks of life

Mental ability, as it influences choice. The person with mental limitations does not maintain his interest very long Therefore, his program calls for short periods devoted to light, easy projects Once he finds a routine task which he can do quickly and effectively, he may not be particularly bored by its monotony, even though the job would seem dull to a more active mind

The mature, well balanced child or adult has inner resources and is often capable of amusing himself for long periods if given challenging materials

It is well to cultivate the art of telling stories to children The child loves to hear old familiar stories, told the same way every time He is especially interested in stories of other children He identifies himself with heroic characters He likes tales of adventure, but they may have an overexciting effect on him which must be taken into consideration

Books The average patient is drawn to books, for they meet him on his own level They speak to him of subjects in which he has already developed an interest But when books are regarded as a means of helping a patient to recover from his malady and his possible depression, they are not merely selected because of their interest to him, but also for the benefit that he will derive from them If they respond to his spiritual and philosophic needs they satisfy the patient They can help in a marked degree to restore or maintain his good emotional balance

Books which are depressing have no place in the patient's environment Books about disease and hospitals are not likely to lift his spirit Books which are picked up at random and handed to the patient by a friend or another patient in the hospital should be challenged, for they are not generally the sort which will do him the most good Indiscriminately chosen books may do more harm than good

## WORK

Work, as contrasted to play, is engaging in a meaningful activity one from which satisfaction may be derived Although what is work

for one person may be play for another, we all derive the most satisfaction from doing what seems to be worth while. Work is one of the four things men live by, according to Dr. Richard C. Cabot. Most of us are engaged in earning our livings or in homemaking—employing both mind and body. But the bed-patient and the handicapped are cut off from their normal activities and long for occupation; the more useful and congenial the better.

Those who take charge of the confined patient have a definite responsibility to cooperate with him when he expresses an interest in some activity which is judged to be within his capability.

## *MEETING A PATIENT'S RELIGIOUS NEEDS*

In the modern practice of medicine it is becoming increasingly recognized that the spiritual needs of patients must be met, if they are to have total care. When a patient enters a hospital he is asked to state his religious preference; this is entered on the record sent to the clinical unit. Many hospitals have full- or part-time chaplains of various faiths to minister to the needs of any who care to have their ministrations.

Often a patient expresses a desire to the nurse that he wishes to see a clergyman and it is she who makes the preparations at the patient's bedside when any rite of a church is to be administered. A nurse never intrudes her own religion upon a patient and she is careful to be courteous and cooperative to clergy of faiths which differ from her own. Some knowledge of the customs and doctrines of different faiths will help her to understand her patient's needs and how she may help to satisfy them.

### THE ROMAN CATHOLIC PATIENT

The sacraments of the Roman Catholic Church which are likely to be given to patients in the hospital or home are: Baptism, Penance, Holy Eucharist, and Extreme Unction.

Baptism. The Roman Catholic Church regards baptism as absolutely necessary to salvation. This rite is very important for the unbaptized child who is in danger of dying. In an emergency, if the patient is likely to die before the arrival of the priest, the nurse should

administer the sacrament If a Roman Catholic is present it would be better to have him perform this rite Enough water must be poured over the head of the patient to ensure its flowing, and the water must touch the skin as it is being poured The person performing the rite must pronounce the form of Baptism "I baptize thee in the Name of the Father, and of the Son, and of the Holy Ghost." To fulfill the purpose of the sacrament, the person baptizing the patient should concentrate on the meaning intended by the Church When baptism is to be administered by the priest, the nurse should remove all articles from the top of the patient's bedside table, and cover it with a clean, white cloth In the hospital the priest brings certain articles and he will tell the nurse what he wishes her to get for him Usually the nurse will bring him a glass of tap water (not iced) and the baptismal shell if it is available

Penance is one of the seven sacraments It absolves those sins committed after baptism and is administered to all Roman Catholic patients expressing a desire to receive the sacrament It is considered particularly essential for those who must undergo an operation or who are critically ill

**Holy Eucharist.** Holy Eucharist, called the *Viaticum* when it is received by the dying, is the sacramental and spiritual food for increasing grace and strengthening the soul Patients about to receive Holy Communion should abstain from all food and drink, except water, from midnight on, although under certain conditions exceptions as to fasting may be made by the chaplain

To prepare for the administration of the Holv Eucharist, the nurse should cover the bedside table with a clean white cloth A crucifix, two candles, a glass of cold water, a spoon, and napkins to be placed under the patient's chin are arranged on the table If the patient has any difficulty in swallowing, the nurse will give him a drink of water after the sacrament has been administered

**Extreme Unction.** Extreme Unction is administered only to those who are critically ill It is the anointing of the body with holy oils to wash away sin, to strengthen the soul at the time of death, or, if it be God's will, to restore the body to health

The nurse prepares the table by removing all articles and covering it with a clean, white cloth She may provide two small plates, one containing six or seven cotton balls, and the other empty A crucifix, two candles, and holy water are needed If the patient is

to receive Holy Communion, a glass of water, spoon, and napkin or communion cloth will be necessary. The bed covers at the foot of the bed are loosened ready to expose the feet of the patient at the proper moment. The priest will tell her if he needs her further assistance.

After the sacrament has been administered the nurse makes the patient comfortable and replaces the bed covers. The used cotton balls are wrapped in paper to be burned.

The presence of the priest and the receiving of the sacraments is of untold comfort to the Roman Catholic. In the hospital the nurse should be alert to notify the nurse in charge of the clinical unit that the patient needs the administrations of a priest, or if she is in the home, to inform the family that the patient's condition indicates that the priest should be called. In emergencies she herself should call the priest and inform him whether or not the patient is conscious, and can swallow or retain food. Sometimes the time of administering a hypnotic is deferred so that the patient can have the satisfaction of being awake when the priest arrives.

## THE PROTESTANT PATIENT

Within the classification "Protestant" will be found a variety of religious faiths, each with its own customs. Often the patient in the hospital is simply listed as *Protestant* but he may be a Baptist, a Congationalist, an Episcopalian, a Lutheran or Reformed, a Methodist, a Presbyterian, a Unitarian, or of some other group. It is usual in hospitals to classify a Protestant as any person who is not a Roman Catholic or a Jew, but there are increasing numbers of members of the Eastern Orthodox Churches and Old Catholics in this country, who, when they are ill, desire to have a priest of their own Church. Members of the Episcopal Church will want their own clergy when they wish to receive the Holy Communion or when Baptism is to be administered. Some Episcopal clergy will also want to anoint their parishioners who are ill. Although each patient would naturally prefer a clergyman of his own Church, most Protestants find a minister of any Protestant Church acceptable when they need spiritual comfort and advice, except when a rite of their own Church is to be administered.

## THE JEWISH PATIENT

The Jewish faith places more emphasis on its dietary regulations, which have come down through the centuries. Varying degrees of strictness in these matters are observed. The nurse must know that the strict Orthodox Jew will eat meat from certain animals only, that some foods are "kosher," that is, prepared under ritualistic conditions, that dishes used for one purpose may not be used for another. The nurse should be alert to note when a Jewish patient leaves certain foods uneaten, for example, pork or any dairy product. She knows then that he is Orthodox and she should inform the nurse in charge of the clinical unit so that such adaptations as are possible in a gentile hospital can be made. The nurse can work harmoniously in a Jewish family by asking about the dietary regulations observed in that home and by conforming to its practice. The Jewish faith requires that a rabbi be called to be with the patient who is dying.

One of the rites of the Jewish faith which is frequently performed in the home is circumcision. A specially trained member of the Jewish faith, called a *mohel*, performs the rite on the eighth day after birth, in the presence of the male members of the family.

While all of these faiths differ, each has a deep and vital meaning to its followers. Some of them use symbols and aids to devotion which are deeply revered and bring consolation to the sick. The nurse will therefore respect and care reverently for such articles as the patient may have, whether they be the rosary, medal or crucifix, or the Bible.

Whenever a clergyman comes to visit a patient he should be announced by the nurse, and such care as the patient requires should be given. Unless the nurse is asked to remain, she leaves the room. In an open unit, the curtains are drawn or a screen is provided to ensure privacy.

Many a lonely patient, especially one who is aged, will, if the nurse appears sympathetic and understanding, ask her to read from the Bible or Prayer Book. Such a request should never go unheeded, for the nurse must share in meeting a patient's spiritual needs.

## *SUMMARY*

### DIVERSIONS

Although the patient who is very ill is self-centered and withdrawn, as soon as he begins to recover he shows interest in his environment: little gifts, visitors, and the other persons with whom he comes in contact.

He will want certain changes made in his room arrangement; he will ask to be propped up in bed, and he will find new uses for his bed table.

Any little pastime satisfies him at first, but if he expects to stay in bed for some time, his physician gives some thought to what sort of activity is best suited to his physical and mental capacity. To avoid frustration, the work must be graded to the patient's level of achievement. The choice of activity is governed by age, sex, manual skill, and mental maturity.

He may merely want something which will make the hours go faster, he may need to have his point of view modified, or he may seek an occupation which accomplishes something of value. A well-defined project helps the patient to finish what he has begun.

The old games—like lotto and checkers—have a perennial fascination for some patients, especially if they have an enthusiastic opponent.

Reading books is popular on all levels. If the nurse or librarian can select a book which meets the particular needs of the patient, the book may prove a lifelong influence for good.

Although men's and women's interests are not so far apart basically as many may suppose, certain activities have come to be regarded as of more interest to one sex than to the other. However, both men and women may enjoy wood carving, for instance, and many men have found knitting, crocheting, and weaving satisfying occupations.

The cost of materials should not be too high for the patient's family to finance, and will not be a burden at all if the handiwork of the patient proves salable.

Since providing diversions is an ever-recurring situation for the nurse, she is likely to become interested in various hobbies as soon as she begins to browse around. She finds it truly rewarding

to bring back to her patient new ideas and suggestions, for without diversions his world might be bound by four walls

## RELIGIOUS NEEDS

The medical profession realizes that spiritual comfort should be included in the total nursing care

The nurse is likely to find that some of her patients belong to religious groups with which she is not very familiar She should tactfully find out what the religious affiliation of her patient is so that she can respond with discrimination and kindness to his wishes

In many large hospitals she will find Roman Catholic patients The hospital is prepared to cooperate with the priest who wishes to administer any of several sacraments to Catholic patients Since there are some definite ritualistic requirements, the nurse will wish to know what is needed and what she should do on these occasions

Most Protestant patients will accept the good offices of any Protestant minister, although they naturally prefer to talk with a clergyman of their own denomination

Many of the Jewish rites involve food If the patient is an Orthodox Jew, the head nurse should be informed so that his diet may be adjusted to his customs In the Jewish home, the nurse will cooperate with the family and will try to do nothing which would be contrary to its way of life

In the hospital the bedside table is cleared and covered with a clean cloth whenever a clergyman is expected to call on the patient

Far beyond the little things the nurse does to meet the needs of the patient is her sharing in the ideal of human brotherhood and her wish to preserve religious freedom

### Questions (Diversions)

1 What sort of plan for diversions should be worked out for the patient who faces a long term illness or a serious handicap?
2 Distinguish between diversions, recreations, and occupations
3 Who should specify what sort of diversion the patient is able to undertake?
4 What is the nurse's general responsibility after the type of activity has been mapped out?

5. Of what use is it for the nurse to take an interest in various diversions?
6. What are some of the factors involved in selecting an activity?
7. Name a way in which the purchase of materials for a hobby may be financed without expense to the family.
8. Discuss some diversions for a young child.
9. What are some activities in which a woman might be interested?
10. Name some hobbies in which men may become skilled.
11. How can the nurse manifest her interest in the patient's occupations? How can she prevent her patient from losing interest?
12. What do you know about weaving and looms?
13. Name several games which may be enjoyed by the patient?
14. What kind of projects can be carried out by the patient whose capacity is limited?
15. What kind of materials fascinate a child or a mature and well-balanced adult?
16. What kind of stories are children interested in?
17. Discuss the selection of a book for a patient.
18. What do you think is the difference between work and play? Do you agree that work affords the most lasting satisfaction?

## Questions (Religious Needs)

1. To what person is the patient most likely to express his wish to talk with his spiritual adviser?
2. How should a nurse feel about cooperating with patients of faiths other than her own?
3. What sacraments does the Roman Catholic priest administer to patients in the hospital?
4. Under what circumstances may a non-Catholic baptize a Catholic?
5. How should the bedside table be prepared if a clergyman is expected?
6. When a nurse knows that her patient would like to see his pastor whom should she notify in the hospital? In the home? In emergencies?
7. In general how will the nurse find out what is needed by the clergyman?
8. Discuss the care of religious articles belonging to the patient.
9. Where does the nurse stay while the patient is talking with his pastor?
10. Should the nurse comply with the patient's request to read from the Bible?

# 30

# CARE OF THE AGING, AGED, HELPLESS, OR DYING PATIENT

The population of our country is becoming increasingly one of older people. Fewer babies and children die today than formerly. Sanitary conditions have improved and preventive medicine has expanded. Medical discoveries are being used to prolong life. The problem of caring for the aged is one which large communities are trying to meet by supplying pensions or old-age insurance. Social agencies are developing programs for the over-sixty group, so that these people will be able to maintain an interest in living.

## GERIATRICS

A whole new area of the study and treatment of diseases common to the aged is growing in importance. The term *geriatrics* is given to this study. Geriatric nursing or nursing care of the aged is an essential part of the preparation of the practical nurse, because she will he called on often to care for older persons.

**Physicial aspects of nursing care.** The practical nurse should bear in mind that the prime aim of geriatric nursing is to prevent the onset of chronic disease. She should also realize that when she is called upon to nurse an elderly patient the latter will usually have

not a single disease condition but possibly three or four such conditions at the same time.

The body of the older person does not break down suddenly in one particular site, as does that of a child, but, instead, wears out gradually. For example, the bones become brittle and are easily broken; the muscular structures are weakened and hernias occur as a result; the teeth are lost, interfering with chewing and the proper digestion of food; the skin becomes thin, and, because it loses its underlying fat, is prone to develop pressure sores. The eyesight and hearing grow dim, making the patient liable to accident. The patient may attempt harmful physical exertion because he ignores or forgets his present limitations.

## LONG-TERM ILLNESSES

Long-term illnesses, often called chronic, fall into two contrasting groups. The most common are degenerative, including circulatory, malignant, metabolic, and arthritic diseases. The second group arises as a result of disability, such as the loss of an eye, or a limb.

The degenerative diseases are progressive, growing worse continually and inevitably. The patient with a permanent disability gradually adapts himself to his handicap.

The patient with a *degenerative* disease will continue to need almost constant nursing care, whereas the person with a disability learns to depend on himself with increasing confidence.

Degenerative diseases are seldom simple but are generally complicated by other disorders. They are the results of deterioration of tissues and of injuries over the years. Often the patient is not aware of his condition until it is well advanced; then he may see his doctor. However, since the deterioration is gradual, quite a long time may lie ahead in which treatment may be instituted.

Degenerative diseases are complicated by (1) causes which have contributed to the condition for a long time, (2) living conditions and personal habits which make them progressively worse, and (3) factors which keep these diseases progressing for the remainder of the patient's life. As a result of complications, treatments are modified to suit individual conditions.

## *CARE OF THE AGED OR HELPLESS PATIENT*

Cleanliness. Many elderly persons would be distressed if they knew that their fingernails were soiled or their clothing spotted, but they cannot keep themselves well groomed because their eyesight is defective Under such circumstances, the nurse must attend to all details of their personal cleanliness, as she would when caring for a child

The skin of old people is very dry and scaly This condition can be improved by rubbing sweet oil or cocoa butter all over the body after the bath It should be remembered that either of these lubricants will stain underclothing and bed linen

Care of a helpless patient's mouth. When the patient is unable to care for his own mouth and teeth, the nurse must do it for him, morning and night The mouth becomes very dry and needs frequent attention The mouth of a very ill patient must be cleaned every four hours, both day and night, as well as after giving nourishment Otherwise sordes will form and adhere to the membrane and, when removed, the membrane will crack and bleed This condition, in turn, will be followed by inflammation, and ulcers may form Under all these conditions, bacteria will multiply and infection will be carried by the lymphatics to other parts of the body

*Equipment for cleansing the mouth*

Small tray or plate
Dressing towel
Kidney basin
Applicators
Celluwipes
Glass or cup of solution
Throat sticks
Ointment, if needed
Paper bag
Gauze

*Solutions commonly used*

Lemon juice and glycerin, equal parts
Listerine, myrrh

Mineral oil and milk of magnesia in equal parts will clean a heavily coated tongue (See Chap 27, "General Care of the Patient")

Diet. Old people often have very little appetite If the nurse takes some trouble to arrange surprises on the tray and will serve

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the food, even if it is only bread and milk, in an original and tempting way, she will find that the patient's appetite will improve.

Since the digestion of the aged may be good, they should be allowed to eat the food which they like and to which they have become accustomed unless there is some special reason for restricting the diet.

Care should be taken to provide food which does not need chewing if their teeth are few or defective, as many are. This suggestion does not mean keeping a patient on liquid or soft diets exclusively. Meat can be cut up in very small pieces; vegetables can be put through a coarse strainer or food grinder, or the canned, strained vegetables prepared for babies may be used.

Feeding the helpless patient. Although most patients like to feed themselves, the patient who is helpless can feel at ease if the nurse sits beside him—or stands, if the bed is too high—and engages in light, pleasant conversation to divert the patient's attention. The tray should be arranged attractively and set on the bedside table. The food should be given slowly, allowing ample time for swallowing. A little from each dish should be offered, as one would choose for himself. If a napkin is tucked under the patient's chin, crumbs will not get on the sheet. The nurse will offer the beverage to the patient as she thinks it is desired.

Sleep. As elderly patients usually need only about six hours of sleep, they are likely to wake early in the morning and should not be obliged to wait until the family breakfast hour. If they are able to help themselves, a thermos bottle filled with hot liquid, such as malted milk or cocoa, may be left on the bedside table. As they are likely to eat very little at a time, nourishment should always be offered between meals and just before they go to bed.

The comfort of the patient is discussed in Chapter 28, "Securing the Patient's Physical Comfort."

When the patient is able to be up and about, such small matters as fitting a pillow behind his back or under his elbows, arranging a footstool comfortably, putting a light shawl over his shoulders or knees add greatly to his comfort. Old people usually insist on the room being too hot, as their circulation is poor and they feel the cold. Therefore it is necessary to show them that before introducing fresh air into the room they will be wrapped up as if they were going outdoors.

They should leave their bedrooms occasionally to get a change, and to enable the nurse to air the room thoroughly, as well as to turn and air the mattress Except in warm weather, the elderly patient is generally cold, as the nurse can tell by feeling his feet and legs When he suddenly feels chilled, he will appreciate an extra blanket or a hot-water bottle or electric pad

In summer, however, he may complain of the heat An electric fan, which is not turned directly on him, will set the air in motion and refresh him, but he should not sit in a draft Other thoughtful gestures are to fan the patient quietly, to change his nightgown and bed linen, to powder his body, to bathe his face and hands and sometimes his whole body, and to lay a cold compress on his head

Care of the bowels and bladder. Care must be taken to ensure a daily movement of the bowels, and the bladder should be emptied at least every six hours A senile patient must be treated in this matter as a young child would The bedpan should be brought at regular intervals through the day or the patient should be taken to the bathroom regularly Sometimes it is necessary to induce micturition by letting the patient hear the sound of running water or, in stubborn cases, by placing a hot wet towel over the lower abdominal region Frequent medication and enemas may often be avoided if the diet is properly planned and plenty of water is given throughout the day

Pads are used under incontinent patients to protect the bedclothes, and to avoid disturbing the patient by too much handling The pads may be made of absorbent cotton or Cellucotton covered with soft old linen or washed gauze They are basted together to keep them in place Several layers of cotton will be necessary to absorb the moisture, and the pads must be large enough to extend to each side of the buttocks A less expensive pad may be made of several layers of newspaper with a top layer of Cellucotton The whole is covered with a piece of soft old cloth, which is fastened underneath with a few stitches A sufficient supply for the day and night should be in readiness They should be kept in a warm place, such as on top of the radiator

For a male patient a second pad should be placed over the pelvic region

To remove a pad, turn the patient on one side, cleanse the skin and dry Remove soiled pad to a basin or newspaper and slip the

dry pad under the patient after first shaking a little powder on the pad. Cover the basin and dispose of the soiled pad by burning.

The prevention of pressure sores (decubitus ulcers). Although any patient should be guarded against the development of pressure sores, certain patients—the emaciated, the paralyzed, the obese, the undernourished, and the elderly—especially in long-term illness, are in danger of having their skin break down.

In general, the skin breaks down because the circulation of the blood is slowed down by lack of exercise, because the air does not circulate freely around the patient's body when he is covered with bedding, and because the weight of the body bears on the bony prominences. These points include the heels, ankles, hips, the end of the spine, and the elbows, and it is at these sites particularly that the nurse watches for the first appearance of redness of the skin. Her constant alertness will generally prevent the development of decubitus ulcers, if it is accompanied and followed by good nursing care, with special emphasis on cleanliness, stimulation of the circulation, an adequate diet with plenty of liquids, and frequent change of the patient's position. The use of hot-water bottles on pressure sores is to be avoided.

Frequent bathing, although brief, removes perspiration and improves the circulation, especially when it is followed by massage and movement of the patient. Special care is taken to keep the folds of the skin dry and clean; if moisture accumulates, excoriations and abrasions may result. Bedridden patients need frequent footbaths for which Epsom salts may be ordered.

The patient may change his position by sitting up several hours each day or by being moved from side to side if he is not able to move himself. He may take exercises in bed; his head may be raised, or he may have extra pillows and a back rest. Airfoam pillows may be tucked under his arms.

His bed should be as comfortable as possible. An airfoam mattress is excellent because it distributes the weight evenly. The undersheet should be drawn taut and be free from crumbs, which should be brushed off after every meal. Footboards or bed cradles lift the weight of the bedding from the patient's feet.

If preventive measures are ineffective and a break in the skin occurs, the nurse should report the fact to the doctor at once. In the hospital she should make her report to the head nurse or team

leader If the skin is red, immediate treatment may prevent further soreness The area around the red spot should be rubbed with alcohol and covered with large cotton pads Airfoam or lamb's wool pads will protect the area "Doughnuts" or rubber rings should not be used, as they irritate the skin and cause further pressure on adjacent areas

Alcohol rubs toughen and refresh the skin, especially when followed by a light application of an emollient—cold cream, mineral oil, baby oil, or a skin lotion Tincture of benzoin may be applied to a superficial area of *unbroken* skin

If a pressure sore develops it is likely to become infected If it is clean it may be bathed with a normal saline solution and dried with a sterile gauze sponge If the doctor has ordered an ointment, it should be applied, the area should be well padded and the pads kept in place with adhesive If a break becomes contaminated, the doctor will order special treatment

Prevention is the prime aim, for once a break in the skin occurs, it is difficult to heal it

**To change the nightgown** Pass your hand through the sleeve, grasp the patient's hand, and draw the arm through Lay the fresh gown across the sheet and remove the soiled gown from under it to avoid exposing the patient Proceed with the second sleeve as with the first

If the nightgown is closed, the procedure is more complicated, especially with a helpless patient Have the patient on his back with knees flexed Have the fresh nightgown ready at the head of the bed Ask the patient to raise his hips slightly, helping him by placing one hand under the buttocks and drawing the soiled gown as far as possible with the other Next raise the shoulders slightly and draw the soiled gown up around the neck Now raise the head slightly with one hand and slip the gown over the head toward the chest, then draw off over the arms, one at a time

Now gather the length of the clean gown up in folds Raise the patient's head with one hand and slip the gown over the head with the other, taking care not to drag it over the patient's face It will then be lying in a loose ring around the patient's neck, and the patient's arms can be drawn through the sleeves, one at a time Then draw the nightgown down over the patient's body, reversing the order in which the soiled gown was removed

There are so many tiring motions in changing a closed gown on a helpless patient that it is better to slit a closed gown down the center of the back and sew on tapes for fastening. Use old gowns for this purpose.

Proceed as described in Chapter 27, "General Care of the Patient."

## *EMOTIONAL ASPECTS OF GERIATRIC NURSING*

The aged are not different from others in their basic needs. They still need security, love, self-esteem, recognition, and the satisfaction of being wanted and useful.

Many of the problems of the aged have to do with the physical limitations that are brought on by the aging process. The patient may feel young mentally and socially, yet be old physically.

The older person tends to cling to the things that are familiar. He may lose his memory of recent events yet retain his recollection of happenings in the past. He may easily become upset emotionally.

The habits of the elderly patient are deeply ingrained. Since the patient will be unhappy if his habits are changed, the nurse will not try to alter them unless his well-being is involved. Most aging persons do not like to be told what to do or to be treated like babies.

The nurse needs to understand the patient's background, his personality, and his mental and physical capacity. She must be scrupulous in her nursing care to prevent the onset of chronic illness. She will get the best result by being ingenious in diverting the mind of her patient into pleasant channels.

Diversions. The day will seem long to the elderly patient if some diversion is not suggested or provided. He may not have lost his power to reason just because he is old; therefore, to interest him, the diversion offered should suit his mental as well as his physical condition. Some patients like to have a newspaper or short story read to them; others would prefer to read to themselves. Some enjoy a game of cards or checkers. A good many prefer to use their hands in sewing or knitting. Most of them like to tell the nurse of their experiences, for events of the distant past have made an indelible impression.

The nurse should be very patient with those who repeat their stories They are trying to be friendly but have only a limited number of subjects to discuss The tactful nurse will not argue with her patients nor try to prove them mistaken They want to have their opinions respected

## THE DYING PATIENT

A depressed attitude frequently accompanies old age Some of the reasons for this feeling are the fear of inevitable death loss of friends, retirement, economic insecurity, and, too often, prolonged illness

The nurse with an attitude of serenity will help the patient to face the new and difficult experience of approaching death He is spiritually fortified and sustained by his religious faith The nurse should be familiar with the varied religious customs regarding death as she finds them in the homes of her patients She can assure the family that death is seldom painful, for in all probability the patient is unconscious—probably under the influence of sedatives—when the end comes However, she should explain that although the patient may appear unconscious he may hear and understand whatever is said, even a whisper may be disturbing to him

The family will prefer to call its own clergyman It is customary in the Jewish religion for the rabbi to stay with the patient during the last hours The Catholic priest should be notified as soon as the patient's condition is considered critical The Protestant minister will usually be called to comfort the patient

The members of the family are, of course, distressed, but they are helped by knowing that everything is being done for the comfort of the patient The thoughtful nurse will realize when one of the family is becoming fatigued, and will suggest that he rest within call She will assure the members of the family that she will let them know if a sudden change should occur She may urge them to keep up their strength by partaking of nourishment or a hot beverage

**Care of the dying patient.** When the digestive processes become inactive, food is not retained If the patient can swallow, small amounts of water or weak tea may be given with a spoon or medicine dropper If the patient is unable to swallow, finely chopped ice

wrapped in gauze, placed just inside the lips, will keep the mouth moist.

Frequent cleansing of the mouth and the inside of the cheeks with mouthwash, followed by an application of mineral oil and lemon juice, is necessary at this time. Absorbent cotton dipped in ice water and placed on the lips is comforting.

Mucus may collect in the mouth and, if the patient can be turned on his side, a piece of gauze placed between the gums and the cheek will assist in drainage.

The nostrils become dry and crusts can be prevented by frequent cleansing with mineral oil or petroleum jelly.

The secretions which gather around the eyes should be removed gently with absorbent cotton dipped in warm water.

Sometimes the patient is restless because of a full bladder; the condition should be reported to the physician. When there is incontinence of urine or feces the parts should be washed and dried as often as necessary and fresh pads placed under the buttocks.

The physician usually orders morphine or some other medication to reduce restlessness and exhaustion and to relieve pain.

The patient's position should be changed about every two hours, alternating from one side to the other with the head and shoulders slightly elevated. For labored respirations a semisitting position affords some relief. Place pillows to support the back and head so that the patient breathes to better advantage. For stertorous breathing, the patient should lie on his side, supported by pillows. The tongue will drop to the side of the mouth, allowing the air to be inhaled more easily.

When respirations have apparently ceased, report the fact to someone in authority at once.

Care after death. The nurse should notice the exact minute when death takes place. If any relatives or friends are present, she should ask them to leave the room, as it will distress them to see her work on the body. Give any money or jewelry to the person responsible for the patient.

Place the patient on his back with a pillow elevating his head and upper part of the body so that the blood will drain down and retard discoloration. Hospitals vary in the procedure for caring for the body after death, but the name, number of the room or ward, and the diagnosis must be plainly printed on special tags to be

attached to the wrist and the shroud before removal of the body to the morgue

*Procedure* Cleanse the body with lukewarm water, use top sheet to cover the part on which you are not working, thus avoiding all unnecessary exposure Take care not to use any pressure, as the skin is easily discolored Trim and clean nails, comb and arrange hair Apply pads to the anus and vagina and hold in place with a square piece of cotton cloth used in the manner of a diaper Pin neatly with safety pins Roll the patient on side and place the shroud sheet lengthwise, roll the body back on the sheet Pin neatly Cover the body with a clean sheet In infectious cases, wear a gown and rubber gloves and disinfect the room and all equipment The room should be clean and put in order, preserving its natural atmosphere Ask the family to select the clothing they wish to be used

The nurse in the home will speak with the undertaker, who will be called after the physician has viewed the body She will also cooperate with the family in making telephone calls and in taking charge of cards attached to floral tributes She may take care of a child or an elderly member of the family

She will appreciate the feelings of the family and will show her sympathy by being quiet, well poised, and helpful

## *SUMMARY*

Because the span of life in our country is being prolonged we have an ever-increasing number of people living to old age Since this change in population has a good many consequences, more and more attention is being given to the study and treatment of the aged Geriatric nursing is especially important to the practical nurse, for her patients are often elderly

Although the aged are not basically different from people of any age in their appreciation of security, love, and recognition, they have the peculiar limitations which are brought about from the gradual wearing out of their bodies They may be alert socially and mentally, but physically impaired and handicapped by age On the other hand, they may be senile, requiring that they be treated like children in many respects Thus their diversions and occupations will vary according to their mental and physical capacity All the

adaptations which are needed must be made by younger members of the household, for the aged have fixed opinions and habits, which they very much dislike to change.

The prime aim of nursing care for the aged is to avert the onset of a chronic disease or diseases. Cleanliness and comfort are the two continuing aims. The elderly need especial attention to the care of the mouth, the skin, the prevention of pressure sores, regular elimination, and sleep. Pillows, footstools, extra blankets when they feel cold, and fans in summer increase the comfort of the old person.

The nurse will find that a knowledge of the patient's background and his present mental and physical conditions are keys to making him happy if she herself has the desire to contribute to his peace of mind.

She will be well poised and competent in the presence of death.

## Questions

1. What name is given to the study and treatment of the diseases of old age?
2. How do the aged like to be treated? What attitudes do they dislike?
3. Discuss the attitude and manner of the nurse who is successful in ministering to older people.
4. Discuss the differences which exist in the outlook and capacities of the elderly. How would these differences affect their diversions?
5. What is the prime aim of geriatric nursing?
6. Name several conditions which are the result of the body's gradually wearing out?
7. What do we mean by complications in the diseases of the elderly?
8. How can the skin of the elderly be kept from becoming dry and scaly?
9. How can the comfort of an elderly patient up in a chair be increased?
10. What is the best way to satisfy the elderly patient who wants the room overwarm?
11. Discuss the appetite and the diet of the aged patient.
12. List as many points as you can which bear on the question of how to prevent the formation of pressure sores.
13. Discuss the nursing care of the incontinent patient.
14. Discuss the importance of mouth care in the aged patient. What is sordes?

15. What type of gown should the aged patient wear in bed?
16. At what times would the use of side rails be imperative in the care of aged persons? If the patient objects, what should the nurse say to make him accept their use?
17. How may the nurse contribute to the happiness of her older patient?
18. Review the nurse's role in after death care.

# 31

# CARE OF THE MENTALLY ILL

Mental illness applies to a broad field of medicine. In all illness, normal life activities are interfered with, and both the body and the mind are involved. However, in a number of diseases, the mental symptoms are more severe than the physical symptoms and should be treated accordingly. The kind of mental illness any one individual may have will be determined by his constitution, his heredity, his environment, the life stresses he has been exposed to, and the way he has been trained to meet his difficulties.

There are degrees of mental illness, varying with behavior which may be irritating and annoying to both patient and those around him, to severe disorder which necessitates separation from the family and community in order to safeguard the patient.

In the last ten years, with the rapid advancement in psychiatric treatment, many more patients are being discharged from mental hospitals to go home, and many patients are remaining with their families and receiving treatment. Such patients require adequate medical guidance and skilled nursing care.

The medical term for mental illness is *psychosis*. In any psychosis, the feeling, thinking, and behavior of the individual is altered. Some psychoses may be temporary, accompanying a toxic condition, such as when a patient has an extremely high fever. Other mental illnesses may be due to disease of the brain or spinal cord, such as brain or spinal tumor, or cerebral hemorrhage. Still others are due to what

is called functional disturbance In these disorders, nothing organically wrong can be found to account for the illness There is a disturbance in the mental life of the patient, making him unable to adapt himself to the world in which he lives The mental symptoms in functional or nonorganic psychosis are usually exaggerations of personality traits that have been present for some time, but have not been recognized

## SYMPTOMS

It is beyond the scope of this book to describe causes and treatment of various mental illnesses However, it is important for the practical nurse to be aware of some of the symptoms which either singly or in combination may be seen in mentally ill patients It is very important for the practical nurse to be sensitive to the quality and intensity of a patient's feelings and emotions

Depression Depression refers to mood This state may vary from a mild feeling of "blueness" to a severe, deep, dark prolonged melancholy Depressed patients are usually hypoactive, but occasionally hyperactivity appears and may be referred to as an agitated depression These patients are potential suicides They should be constantly guarded, neither being left alone nor given an opportunity to harm themselves Even being left alone for a minute only might result in tragedy They must be watched closely to see that they do not use articles such as scissors, knives, and glass in an attempt to destroy themselves

*Nursing responsibilities* in caring for the depressed patient should include the following

1 Create an atmosphere of friendliness, sympathy, and understanding, making the patient's room as cheerful as possible

2 Re establish the patient's self confidence, reassuring and praising whenever possible

3 Give the necessary nursing care, setting up a program to cover all hygienic activities—bathing, brushing teeth, combing hair, exercising, and feeding

4 Help to provide some occupational or diversional therapy

5 Constantly watch for signs of suicide

6 Continue to watch the patient who is recovering from a deep depression, since such patients frequently deceive those about them

by their apparent cheerfulness. It is at this point that patients often are successful in carrying out suicidal attempts.

7. Watch for changes in the patient's mood.

8. Protect the disoriented patient by seeing that bedsides are always attached to both sides of the bed—even if the nurse leaves the patient for a moment only.

Elation. Elation refers to a very different mood. This may range from an unusual alertness to a decidedly heightened state of "delirious mania." Elation is usually accompanied by hyperactivity and overtalkativeness, with a flight of ideas. These patients must be handled carefully, since they often resent any interference and may harm those about them.

*Nursing care* of the elated patient should include:

1. Handling the patient with consistent kindness, firmness, and fairness

2. Avoiding any unnecessary stimulation, irritation, fatigue, and exhaustion

3. Directing the patient's activity and recreation

4. Giving the necessary nursing care and attending to the patient's personal hygiene

5. Keeping up the patient's nutrition and fluids, since he burns up much energy in his constant activity

Senile psychosis. Senile psychosis is a chronic mental illness which occurs in old people. The psychosis is due to a hardening of the arteries of the brain resulting in sluggish circulation, anemia, and destruction of brain cells. Symptoms of this disease vary according to the degree of the hardening of the arteries. The symptoms may include personality changes, fatigability, irritability, inability to concentrate, impairment in comprehension, loss of memory (particularly of recent events), disorientation, and poor judgment.

*Nursing care* of the senile patient should include:

1. *Establishing a simple regulated daily schedule of exercising,* eating, and sleeping

2. Providing simple occupational activities that are of interest to the patient and within the limits of his physical capacities

3. Bathing in which the temperature of the water should be neutral (the patient should be assisted in and out of the tub to avoid falling)

4. Watching for symptoms of cerebral hemorrhage, coma, paralysis on one side of the body, rapid pulse, and stertorous breathing

3. What science is now dealing quite successfully with mental illness?
4. What is the medical term given to mental illness?
5. What can you say about depression as a mood of the mentally ill?
6. What harm may the depressed mental patient do?
7. What can you say about elation as a mood of the mentally ill?
8. What harm may the elated patient do?
9. What is meant by "senile psychosis"? Of what is it the result?
10. Name several phases of nursing care for the senile patient.
11. What is "postpartum psychosis"? When is it likely to occur?
12. What are some of the symptoms of postpartum psychosis?
13. Why are side rails sometimes necessary for the mentally ill patient?

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13 Why are side rails sometimes necessary for the mentally ill patient?

# 32

# ELIMINATION OF BODY WASTES

## *DISTURBANCES OF INTESTINAL FUNCTION*

In normal health the intestinal tract excretes waste material every 24 to 48 hours in the form of one or more soft, shaped, brownish stools. Poor hygienic and dietary habits and/or disease processes in any part of the body disturb or prevent this regular functioning. (Review Chap. 10, "The Digestive System.")

The nurse should observe and record carefully the frequency, amount, color, consistency, and odor of the patient's stools as well as any unusual matter such as blood, pus, mucus, or worms, in order to assist the doctor in his diagnosis and treatment. Stools containing any abnormality should be kept for the doctor's inspection.

Diarrhea and constipation are symptoms that the intestinal tract is not excreting wastes normally.

Diarrhea is a condition characterized by frequent watery stools. It is caused by irritation which increases peristalsis and prevents the normal absorption of water in the large intestine. It is a symptom occurring in many disorders and diseases. It may be accompanied by nausea and vomiting.

The patient should remain in bed to conserve his strength. Food is withheld for several hours. After the nausea has ceased, the patient may have such liquids as hot water, weak tea, or barley gruel in small amounts. Gradually bland foods are given. Since the body may

become dehydrated, he should have a great deal of water and other liquids

The nurse should report the first signs of diarrhea and record the number of stools, and their color and consistency Blood in the feces is regarded as a serious symptom and should be reported at once

Hot applications to the abdomen may be ordered for the comfort of the patient Sometimes starch enemas are given to soothe the irritated lining of the intestines

Constipation is a condition in which the bowels cannot evacuate normally because the fecal matter has become dry and hard Just how often the bowels should move varies with the individual

Diet is important in establishing regular elimination Foods high in residue, such as bran, whole grain cereals, fruits, nuts, and green vegetables supply the necessary roughage to irritate the intestinal walls and stimulate peristalsis Eight or ten glasses of water a day assist in maintaining regularity

Good bowel habits established in childhood help a great deal in avoiding difficulties later in life However, when a person is not able to get enough exercise, or he changes his drinking water, food, or manner of living, as when he is in the hospital, he sometimes becomes constipated and requires measures to stimulate elimination His diet may be modified to include more roughage and water Sometimes the physician orders a cathartic or an enema, although their continued use is habit-forming

## ENEMAS

An enema is an injection of fluid into the rectum and colon to stimulate defecation or to obtain certain local or systemic effects

The type of enema, the kind of solution, the temperature and the amount of solution all vary with the effect desired and the age and condition of the patient No enema should be given unless the physician orders it

Enemas may be classified as (1) evacuating (including cleansing, for adult and infant), purgative, and carminative, and (2) retention (including lubricating, medicated, and emollient)

Cleansing enemas are given

1 to relieve constipation
2 in preparation for diagnostic tests
3 in preparation for an operation

A cleansing enema may be used when the function of the intestines is retarded during illness because the patient is inactive. Often his diet lacks roughage, which is necessary as an irritant to the muscular walls of the intestines. If the stomach is disordered an enema is preferable to a cathartic.

The enema consists of one of the following solutions:

1. a soap solution (30 cc liquid soap to 500 cc water)
2. a normal saline solution (1 tsp salt to 500 cc water)
3. tap water

One to two quarts of solution at 105°F. (40.5°C.) are prepared for an adult. One to one and a half pints are needed for a child.

*Equipment*

| | |
|---|---|
| Sheet or bath blanket | Dressing basin |
| Rubber square | Pitcher |
| 2 bedpan covers | Toilet paper with petroleum jelly |
| Rectal tube | Warm bedpan |
| Irrigator stand | Thermometer |
| 1 dressing towel | |

Irrigating can, tubing, and glass connector (a funnel and rectal tube or a fountain syringe are generally used in the home)

*Procedure.* Explain the procedure to the patient. Screen him for privacy.

Wash your hands. Assemble the needed equipment in the utility room. Test the irrigating can and tubing for leakage.

In the hospital a prepared soap jelly is provided. Put the required amount of water into the pitcher. Add 1 oz (30 cc) of soap jelly to each pint (500 cc) of water. The solution is prepared at 105°F. (40.5°C.). (The water is put in the pitcher first, for when water is poured on soap jelly air bubbles are produced which, if introduced into the intestines, would cause discomfort.) Clamp the tubing and pour the solution into the irrigating can.

Place the irrigating can and rectal tube in a dressing basin. Warm the bedpan and cover it with rubber square and a cloth bedpan cover. Rest the basin on this cover and lay a second bedpan cover or a towel over the entire assembled equipment. Then carry it to the bedside table. The bedpan is placed on a chair facing the bed. Hang the irrigating can on the standard.

Lower the patient's headrest, remove one pillow and place it over

the back of a chair. Turn back the upper bedding to the patient's waist level or to the foot of the bed. Cover the patient with a sheet or bath blanket. Place the rubber square with its covering under the patient. Put the patient in position, lying either on his left side or on his back with his knees flexed. If the patient has lost control of the anal sphincter, always place him on a bedpan to give an enema. Turn the nightgown back above the waist. Leave a V-shaped opening between the draping blanket and the turned-back bedding. Drape with a towel.

The nurse can balance her weight comfortably by flexing her right leg and extending her left leg.

*To administer the enema.* Lubricate the tube. Allow some of the solution to flow through the tubing so as to expel air and to warm the tube. Clamp the tubing. Very gently and carefully insert the well-lubricated tube into the anus for about four inches. Unclamp the tubing. Hold the rectal tube in place with one hand, controlling the rate of flow with the fingers. Place the irrigating can not more than 18 inches above the level of the mattress.

The first 500 cc should be introduced slowly, using about five minutes, so as not to excite bowel contraction. If the patient complains of cramps, the flow should be stopped for a few minutes or until more of the solution can be tolerated. If the solution is to be retained as much as five minutes, hold the buttocks together to help the patient retain the solution.

After the desired amount of solution has been given, clamp the tubing and remove the rectal tube gently. Wrap the lubricated end in toilet paper and place in the dressing basin. Place the bedpan under the patient.

Cover the patient again with his bedcovers. The sheet used to drape him may be left in place to prevent the bedclothes from being soiled with forcibly expelled fluid. The patient should be provided with a bell.

Take care of used equipment, covering it while it is being removed from the room. Wash the rectal tube first in cold water, then in warm soapy water. Boil it for three minutes in water containing salt to prevent the rubber from softening.

Return to the patient frequently to see if he is obtaining proper results. When ready, remove the bedpan, cover it with enema rubber and the bedpan cover. See that the patient is clean and dry. Check

the patient again in five minutes to see if everything is all right. If he has attended to his own toilet, provide local bathing equipment. Give him warm water in which to wash his hands after using the bedpan. Ventilate the unit. Remove the screen. Record the result of the enema. Wash the bedpan in warm soapy water and put it away. Wash your own hands.

*Important points to remember*

1. Avoid unnecessary exposure.
2. Have the patient on his left side or back.
3. Avoid blocking the end of the tube with lubricant.
4. Avoid injecting air into the bowel.
5. Give the enema slowly.
6. Pinch the rectal tube when removing it to prevent the solution from dripping on the bed.
7. When an enema is properly given, it does not cause the patient any marked pain or discomfort.
8. Always report to the physician or head nurse if the patient is unable to expel the enema.
9. Wash your hands thoroughly after attending the patient.

## To give an enema to an infant or child

*Equipment*

Blanket
Small bedpan
Rubber sheet
2 bath towels (1 folded)
2 diapers
Irrigating can, rubber tubing, and connecting tube
Petroleum jelly or cold cream
Catheter or small rectal tube
Squares of toilet tissue
Mild soap solution or salt solution: ½ tsp salt to 8 oz of water (temperature 105°F., 40.5°C.) in small pitcher or graduate
Amount of solution: Small infant—4 oz to 1 pt. Child—1 pt to 1 qt

*Procedure.* Place the rubber sheet on the bed and cover with a bath towel. A second person may be needed to assist.

Place the baby on his back with the buttocks somewhat raised by a folded bath towel under his hips. Cover him with a blanket. Hang the irrigating can 12 inches above the baby's anus. Lubricate the catheter or rectal tube. Run some of the solution through tubing to remove air. Clamp tubing.

Gently insert the catheter or tube into the rectum. Unclamp the tube and allow the solution to run in slowly. Hold the infant's but-

tocks together to aid him in retaining the solution for a few minutes so that the solution has an opportunity to soften the movement

Hold the baby on the bedpan until he has expelled the solution

Note the results of the enema returns as to consistency, color, and amount of stool If the first enema does not bring about a bowel movement it can be repeated

If there is no irrigating can in the home, a funnel and a small rectal tube may be used, but in all probability it will be necessary for a second person to assist

It is a good idea to diaper a baby with a couple of thicknesses of diaper after he has had an enema, as he may expel some of the retained solution later

Wipe off the catheter or rectal tube with toilet paper squares and wash it in hot soapy water Return the equipment to its proper place

**Purgative enema.** This enema is given when a cleansing enema is ineffectual in relieving constipation The solution commonly used is

| | |
|---|---|
| Magnesium sulfate | 1 oz (30 cc) |
| Glycerin | 2 oz (60 cc) |
| Water | 3 oz (90 cc) |
| *or* | |
| Glycerin | ⅓ to 1 oz (10 cc to 30 cc) |
| Water | 1 to 3 oz (30 cc to 90 cc) |

The proper temperature is 105°F (40 5°C )

Carminative enemas are given to stimulate the expulsion of gas (or flatus) from the colon The solution for this enema may contain either turpentine, or milk and molasses

*Turpentine solution*

| | |
|---|---|
| Turpentine | 1/5 to 1/2 oz (6 cc to 15 cc) |
| Soap solution | 1 qt (1000 cc) Temperature 105°F (40 5°C) |

*Milk and molasses solution*

| | |
|---|---|
| Milk | 3 oz to 8 oz (90 cc to 240 cc) |
| Molasses | 3 oz to 8 oz (90 cc to 240 cc) |

Heat milk, add molasses slowly, and stir until mixture is blended thoroughly Give the solution at a temperature of 105°F (40 5°C )

Retention enemas are those which are retained in the bowel for a specified period (usually from 2 to 12 hours) in order to obtain the most effective results

*To give a retention enema.* The equipment and procedure for administering a retention enema are about the same as for a cleansing enema. A catheter, size 16–18 French, is used instead of the colon tube. When a small amount of solution is ordered, the catheter is attached to a funnel. The solution is poured from a pitcher.

Have the patient lie in the dorsal recumbent position to facilitate retaining the solution. Lubricate the catheter and insert it four inches into the rectum. Pour solution into the funnel and allow it to run in very slowly. When the required amount is given, pinch the catheter and withdraw slowly. Wrap used end in toilet paper and place in basin.

Hold the buttocks together for a few minutes. The solution should be retained.

Make the patient comfortable and remove equipment. Record time, amount, the solution given, and whether or not it was retained.

Lubricating or oil enemas are used to soften hardened feces in prolonged constipation and following rectal surgery to prevent injury to the incision. Mineral, olive, or cottonseed oil is generally ordered in amounts varying from 5 oz to 6 oz (150 cc to 180 cc).

Pour the oil into a glass graduate and place in a pitcher of hot water. Allow it to remain there until the proper temperature, 100°F. (37.7°C.), is reached. If this enema is not expelled in from four to eight hours, it is generally followed by a cleansing enema.

In the home, the oil for a lubricating enema may be heated to 100°F. (37.7°C.) in a double boiler and carried directly to the bedside.

Medicated enemas contain drugs for one or more purposes, such as sedation, stimulation, anesthesia, to destroy worms, or to check hemorrhage. The temperature may vary with the drugs used, but 105°F. (40.5°C.) is usually ordered.

Emollient enemas are given to check diarrhea or to soothe and relieve irritation of an inflamed rectal mucous membrane.

A starch solution is commonly used.

Starch enema. Mix 1 tsp of starch with cold water in a saucepan. When the paste is smooth add slowly 6 oz (180 cc) of boiling water. Place over heat, and stir until the mixture becomes clear. If necessary, add hot water to make up 6 oz. The solution should be cooled to 105°F. (40.5°C.) before the enema is given. Tincture of opium

is sometimes ordered and it should be put into the solution immediately before adminstering the enema.

Siphonage. When a patient is unable to expel an enema it is sometimes necessary to draw back the solution. This procedure is known as siphonage.

Siphonage is based upon the principle that fluids will flow in the direction in which most force is exerted. The pressure on the enema in the colon is higher than the pressure of the air outside the body. Therefore, it is possible to use the principle of siphonage to make the fluid flow from the intestine into a receptacle placed lower than the patient's body. The greater the height of the column of fluid (or the greater the drop from the height of the intestine to the lower end of the tube) the greater will be the force of the flow. Too great a force should be avoided as it will be injurious to the intestine.

*Equipment*

| | |
|---|---|
| Enema tray | Small pitcher or graduate of warm water |
| Rectal tube | Jar of lubricant |
| Funnel | Towel |
| Rubber square | Bedpan |
| | Newspaper |

*Procedure.* Collect equipment on tray and bring it to the bedside. Attach the funnel to the upper end of the tube. Have the patient lie near the edge of the bed in the usual position for an enema. Place the rubber square and towel under the buttocks. Have a chair covered with a newspaper close to the bed. Place the bedpan on it. Lubricate the tube and insert it about four inches. Pour water into a funnel. After some of the water has entered the colon, but while some of it still remains in the funnel, quickly direct the funnel downward over the bedpan. This creates the siphon and the fluid drains into the bedpan.

It may be necessary to repeat the procedure several times until a satisfactory amount of the enema has been expelled.

Impacted rectum. In some cases of constipation, the patient feels discomfort from distention but cannot get relief by having an adequate movement. If the condition continues the rectum may become impacted, that is, distended with hardened masses of feces which have become so tightly wedged that the muscles of the rectum are not strong enough to move them. This condition may occur when

the patient is elderly or unable to exercise, as in a long-term illness, especially when there is paralysis.

The treatment generally ordered is an oil enema to soften the fecal mass, but if this procedure is not successful, the doctor may introduce a gloved finger into the rectum to break up the hardened mass. Then a cleansing enema is given.

An impacted rectum can sometimes be avoided if the nurse is alert to report any irregularities in elimination, so that the doctor may order preventive treatment.

**The flatus tube.** When the patient is unable to move about and exercise, there may be an accumulation of gas in the intestines. He is very uncomfortable if he cannot expel the gas. A rectal tube may be used to aid in the expulsion of gas.

Place the patient in a comfortable position. Protect the bed with a rubber square and towel. Lubricate the rectal tube and insert it into the rectum placing the other end in a small basin or urinal. Remove the tube in about twenty minutes. Record the patient's reaction, the time of insertion, and the approximate amount of flatus expelled.

*Rectal suppositories* are discussed in Chapter 35, "Administration of Medicines."

**To give a colonic irrigation.** The colonic irrigation is commonly given to cleanse the large intestine of excess mucus, feces, and toxic matter. Any feces in the lower colon must first be expelled, by an enema, if necessary, and the irrigation must be given so gently that it does not stimulate defecation.

*Equipment*

Irrigating can with 1 yd rubber tubing and screw clamp
18-in. length of rubber tubing (for drainage), and screw clamp
Rectal tubes—1 medium or 2 small, depending on method used
Glass connectors—1 Y or 2 straight, depending on method used
Dressing basin
Petroleum jelly
2 large pitchers
Solution: 2 to 4 gallons, as ordered:
- Tap water
- Normal saline
- Soda bicarbonate, 1 to 5 per cent
- One half of solution at a temperature of 105°F. (40.5°C.) and the remainder at 110°F. (43.3°C.) to allow for cooling

Irrigating stand

Newspaper
Pail
Stool or low chair
Bedpan with bedpan cover
Rubber protector with cover
Bath blanket

*For the one-tube method,* attach rectal tube to one prong of a Y connector, attach drainage tube to other prong, and attach tubing from irrigating can to base of Y Screw clamps on inlet and drainage tubing enable the nurse to introduce a small amount of solution and then drain the bowel by opening the drainage tube and closing the inflow tube

*For the two tube method,* two small rectal tubes are inserted into the rectum, one connected by glass connector to tubing from the irrigating can, the other connected by glass connector to the drainage tubing The bowel may be drained continuously while the solution is being given, or by using the screw clamps on the tubing the solution may be given and drained off alternately

*Note* Unless the patient has had a normal stool a few hours before, or is getting daily colonic irrigations, an enema should be given one half to one hour before the colonic irrigation is started

*Procedure* Carry all equipment to the bedside Explain procedure to the patient and enlist his cooperation, as it is a long, tiring procedure Cover the patient with a bath blanket, folding top bedding to the foot of the bed Put an extra blanket over the patient if needed Place rubber protector with cover under the patient Have the patient comfortable on his left side, with his knees flexed

Protect the floor with a newspaper and place pail on stool or chair, so that the top of the pail is not more than from 6 to 8 inches below the level of the anus Hang the irrigating can from the stand so that top of can is not more than 18 inches above the mattress Allow the solution to run through the tubing to expel air and to warm tubing, then clamp Lubricate the rectal tubes and insert as for an enema, 4 to 5 inches

Clamp off outflow tube and allow 300–400 cc of solution to flow in Clamp the inflow tube and open clamp of outflow tube, allowing solution to return in a pail at the side of the bed Maintain continuous or intermittent flow, as ordered Give irrigation until the return is clear, or until the amount of the solution ordered has been given

If the patient shows signs of pain, discomfort, or exhaustion, stop treatment. Clamp inflow tube and remove, if two-tube method is used. Allow outflow tube to drain until the colon is emptied of solution (10 minutes). Give bedpan if patient so desires.

Cleanse and dry patient, readjust bedding, and leave patient comfortable.

*Record:* amount, temperature, and kind of solution given; character of return flow, as to gas, fecal material, odor, presence of mucus, or other matter; effect on patient.

*Care of equipment:* as for enema.

*Note:* A colonic irrigation must never be given in the home without the order of a reputable doctor. The nurse should explain to the patient, also, that it is a procedure which cannot be safely or effectively self-administered because of the position the patient must take and the necessary control of the inflow and outflow of the solution.

## *RETENTION OF URINE*

Very often during illness the patient is unable to expel urine from the bladder; this condition is called retention. This may be caused by emotional tension, fear of pain, or embarrassment in using the bedpan. Following anesthesia the bladder sphincter sometimes becomes temporarily paralyzed. Mechanical obstruction, such as an enlarged prostate gland or a stricture of the urethra, will cause retention. (Review Chap. 12, "The Urinary Tract.")

The nurse can do much to relieve emotional stress or fear. She can explain the functions of the kidneys in a calm, casual manner, and encourage the patient to urinate regularly. She can provide privacy for the patient by carefully screening the unit.

The following simple measures may induce micturition (urination):

1. The use of the power of suggestion; the sound of running water or of water being poured from one pitcher to another, and the pouring of warm water over the perineum are examples of this method.
2. If the physician will permit, the patient may assume either of two positions: (a) take a semisitting position supported by a back rest, which position puts some pressure on the bladder and the urethra; or (b) stand by the bedside or use a commode placed by the bed.

3 The forcing of large amounts of water or lemonade is a common measure for this purpose

4 The nurse should do everything possible to help the patient relax

## CATHETERIZATION

Catheterization of the bladder is the introduction of a rubber tube, called a catheter, into the bladder The tube is passed through the external opening, the meatus, and the urethral canal, into the bladder (Review the anatomy of the urinary tract )

Catheterization is done for the following reasons

1 To relieve the retention of urine

2 To obtain a sterile specimen of urine for laboratory analysis

3 To assist the doctor to determine whether retention or suppression of urine is present

4 To keep the perineum dry after operations

An inlying catheter, or Foley catheter, is used to provide drainage from the bladder (1) when certain disease conditions prevent normal excretion of urine, (2) when it is necessary to prevent voluntary micturition following certain types of surgery, and (3) frequently for incontinent patients in order to keep them dry and to prevent decubitus ulcers

Catheterization procedures vary in different hospitals, chiefly in the details of assembling and handling the equipment The essential equipment and the principles underlying the procedure remain the same

The general principles are

1 The patient should be in a dorsal recumbent position with the knees well flexed, so that she is relaxed and the external opening to the bladder is easily accessible

2 The external genitalia, the meatus and surrounding area should be thoroughly cleansed so that no infectious material is introduced when the catheter is inserted

3 The catheter must be sterile and must not come in contact with anything before being inserted into the meatus

4 Gentle cleansing of the meatus and careful handling of the catheter when inserting it are necessary to prevent irritation or any break in this delicate tissue, which might provide a focus for bacterial growth

Procedure for catheterization of a female patient adapted for use in the home. (Usually the doctor, man nurse, or orderly will catheterize the male patient.)

The equipment may have to be improvised, but always remember that sterilization is the important factor. You may use unchipped china or enamel bowls for the solutions. A mason jar may be used to collect the urine and an inexpensive bowl or small pan to collect the waste. These articles should be kept in a special place and be discarded when the procedure is discontinued.

A freshly ironed towel may be used to protect the bed.

Put bowls and container for urine into a large kettle, cover with water, and boil for 5 minutes. Boil cotton pledgets in a small covered pan for 5 minutes. Boil catheter, forceps, and finger cots in a small covered pan, which should be kept exclusively for this purpose. Tubes of water-soluble lubricant, sterile cotton pledgets, and gauze may be purchased at a pharmacy.

*Equipment*

Tray (scrubbed clean) large enough to hold sterile articles
Sterile articles:
- 2 rubber catheters #14–16 French; Forceps; 2 finger cots — in covered container in which they were boiled
- 1 gauze square on which is dropped sterile water-soluble lubricant
- 12 cotton balls
- Small wide-mouthed bottle or jar with cover, if sterile specimen is to be obtained
- 2 small basins or bowls in which are placed:
  - mild soap solution
  - boiled water or normal saline

Unsterile equipment:
- Bath blanket
- Rubber protector with clean towel to cover
- Basin or jar to receive urine (1-qt size) (no more than 1½ pt of urine are to be drawn off, in order to avoid bladder damage)
- Basin for waste
- Gooseneck or other floor lamp or flashlight

*Procedure*. Explain procedure to patient and tell her why she should remain quiet, keeping her knees flexed, until the end of the procedure. If she is unable to do this, a second person's assistance will be needed to hold the legs, and the light.

Bring unsterile equipment and the tray with sterile equipment to the bedside Arrange the tray on a table at the foot of the bed

Replace upper bedding with a bath blanket, folding top bedding to the foot of the bed See that the patient is clean locally, washing with soap and water if necessary Put the rubber protector covered with a clean towel under the patient

Place the patient in the dorsal recumbent position and drape as for a vaginal examination

Place the basin to receive the urine between the patient's knees Place the basin for waste at the foot of the bed

Arrange a lamp or light so that it will shine directly on the perineal area

Scrub hands under running water for 3 minutes

Return to the bedside, raise the draping sheet with little finger of left hand to expose the perineal area

Uncover the container, take out finger cots without touching forceps or catheter, and put cots on thumb and first finger of the left hand

Separate labia gently, using covered thumb and finger, and maintain this position until the end of the procedure

With your right hand take the forceps and place 3 or 4 cotton balls in each basin of solution Using forceps to hold the cotton balls, gently wash downward over the meatus with each of the cotton balls, from soap solution, discarding each ball after use in the waste basin Repeat, using the cotton balls which are in water Place forceps in basin of water

Pick up catheter at least 2½ to 3 inches from the tip, lubricate by dipping in lubricant on gauze, and insert gently (1½ to 2 inches) into meatus slightly upward and backward until urine begins to flow

If a sterile specimen is desired, allow a small amount to flow into the small bottle or jar When the urine ceases to flow, withdraw the catheter gently and place in the waste basin

Dry the patient gently with remaining cotton balls using forceps Place the forceps in the waste basin

Place the basin containing urine and the waste basin on the tray Remove the rubber protector Use the towel under patient for drying further, if needed Remove bath blanket, rearrange bedding, and leave the patient comfortable

*Record* time of catheterization, amount and character of urine

obtained, and effect on patient. Label the specimen bottle "Catherized specimen," if a specimen has been ordered.

*Care of equipment.* Discard waste, wash catheters, forceps, and basins with warm soapy water and boil 10 minutes. Return other equipment to its proper place.

## BLADDER IRRIGATION

Bladder irrigation is generally ordered by the doctor to cleanse the bladder and catheter when the patient is on constant urinary drainage.

The following equipment is suggested for doing the treatment in the home:

- Sterilized solution basin
- Solution ordered at 100°F. (37.7°C.)
- Sterilized asepto syringe and bulb
- Sterile gauze square
- Basin for return flow of irrigation

*Procedure.* Have patient in dorsal recumbent position. Arrange bedding conveniently. Place basin for return flow between the patient's knees. Separate the catheter from the glass connector. Cover the end of the glass connector with sterile gauze, and tuck under drawsheet. After expelling the air from the bulb, fill the syringe with solution. Introduce tip of syringe into catheter and inject solution slowly and gently into the bladder. Remove the syringe and let the solution drain into the basin. Repeat until the return flow is clear or all of the solution has been used. Be careful that the tip of the syringe touches nothing except the solution and the catheter.

*Record and report:* time of treatment; kind and temperature of solution used; character of return flow; and effect on the patient.

Wash and boil solution basin and bulb and syringe. Wash other basin in hot soapy water.

## *SUMMARY*

Elimination of body wastes includes both the evacuation of fecal material and the excretion of urine.

Diarrhea or constipation are indications that the intestinal tract

is not functioning properly The nurse should observe and report these and other unusual conditions as shown by the character of the feces She should not give treatments without doctor's orders

Diet is an important factor in keeping the intestinal processes normal A high-residue diet stimulates peristalsis, a bland diet is nonirritating Liquids aid in keeping the bowels normal

Enemas are given to stimulate defecation, the type of enema varying in kind, temperature, and amount of solution, with the effect desired Enemas are classified as (1) evacuating and (2) retention The evacuating enemas include cleansing (for adult, and infant), purgative, and carminative, and the retention enemas include lubricating, medicated, and emollient

Siphonage is resorted to when the patient cannot expel the enema

The flatus tube is used when the patient is unable to expel gas which has accumulated in the intestine

Colonic irrigation is given to cleanse the large intestine

When the patient is unable to expel urine from the bladder, even after some simple measures have been tried, catheterization may be necessary Although catheterization procedures vary in different hospitals, the underlying principles remain the same The procedure described is adapted to the female patient in the home When a patient is on constant drainage, a bladder irrigation may be ordered for cleansing purposes

## Questions

1 Name some facts about the patient's stools which the nurse should observe, record, and report carefully
2 Name two symptoms that indicate the intestinal tract is not functioning properly
3 What is the cause of diarrhea? By what other symptoms may it be accompanied?
4 Discuss the giving of foods and liquids after nausea accompanying diarrhea has ceased
5 Discuss diet in relation to proper elimination
6 What is an enema? In what respects do solutions for enemas differ?
7 For what three purposes are cleansing enemas given?
8 Why is the water put in the pitcher before the soap jelly is added?

9. Why is some of the solution allowed to flow through the tube before it is inserted?
10. When is a purgative enema given?
11. For what purpose is a carminative enema given?
12. What materials may the solution for a carminative enema contain?
13. How can the nurse help the patient to retain an enema?
14. When is a lubricating or oil enema advisable?
15. How is oil warmed for such an enema?
16. What is the effect of starch in an enema?
17. On what principle is siphonage based?
18. How does the height of the column of fluid affect the force of the flow?
19. What has to be done to the funnel to make siphonage effective?
20. Why is a flatus tube sometimes needed?

# 33

# IRRIGATIONS OF BODY CAVITIES

An irrigation is a continuous flow of water or special solution applied to a certain part of the body or to a body cavity for the purpose of applying moist heat or of cleansing the cavity. An irrigation is sometimes referred to as a *douche*. Irrigations are frequently ordered for the treatment of the throat, the eye, and the vagina, and following a colostomy operation.

Since there is danger of spreading infection and damaging the delicate tissues, these procedures should be attempted only by an experienced nurse. The practical nurse should have performed them under the careful supervision of the instructor or team leader before assuming the responsibility for these procedures in the home.

Before giving any irrigation, the nurse should wash her hands thoroughly as in preparation for any other treatment. (See Chap. 3, "The Practical Nurse: Her Duties to Herself.") After finishing the treatment, the procedure of hand washing should be repeated.

Throat irrigation. A throat irrigation is given:

1. To soften the mucus and to wash away secretions
2. To relieve pain and inflammation of throat or tonsils
3. To stimulate circulation and relieve congestion

A throat irrigation is sometimes preferred to a gargle because of the beneficial effect of prolonged moist heat.

Salt solution is frequently used in the proportion of one teaspoonful of salt to one pint of water. Two quarts of this solution is the usual amount.

Karo or sugar solution is used in the proportion of 1 tablespoonful to 1 quart of water.

*Equipment*

Basin
Irrigating can or bag, rubber tubing, and metal clamp
Dressing towel
2 bath towels
Irrigator stand
2 qt solution as ordered
Glass nozzle with rubber tip or catheter or glass tube
Pail for return solution
Rubber sheet

*Procedure.* Wrap the glass nozzle in gauze and boil in a small container. Attach the tubing to the irrigating can and boil.

Prepare the solution at a temperature of 110° to 112°F. (43·3° to 44·4°C.) and pour into the irrigating can. Drain water off the glass nozzle and place in basin with the other equipment. Carry to the bedside. Protect the patient's shoulders and chest with a bath towel. If the patient is in bed, protect the bed with a rubber sheet.

The irrigating can or bag is hung on an irrigator stand, or it can be suspended from a hook on the wall or held by another person. The height helps to regulate the flow or pressure. The can is usually from one to three feet above the patient. When the can is higher than three feet, the pressure is too strong.

Wrap glass nozzle in gauze and boil in small container for 10 minutes.

Attach the sterile nozzle to the tubing just before using.

The nurse should explain the procedure to the patient and examine his throat carefully before beginning the treatment in order to know where to direct the stream. Make the patient as comfortable as possible, either sitting on a chair or in bed as near as possible to the edge.

Instruct the patient to hold his breath while the solution is flowing. He should bend over the basin with his mouth wide open, while the nurse directs the flow. The nozzle should not touch the back of the throat as this will cause gagging. The patient may be able to direct the flow himself.

As the patient must hold his breath while the solution is flowing

in, the tube should be clamped off occasionally to allow the patient to take a few deep breaths

Sometimes the patient prefers to lie across the bed with his head over a basin placed on a chair beside the bed He can direct the stream himself while the nurse holds the can and controls the flow

In this position, it is easier for the patient to keep the tongue flat, and there is less danger of gagging or of swallowing the solution

When a throat irrigation is properly given, it affords great relief The temperature of the solution should be carefully tested, for if it is too hot it will burn the sensitive tissues of the mouth and throat It is also important to guard against gagging and choking the patient

To give a vaginal irrigation There is normally a slight vaginal secretion which tends to discourage the growth of bacteria, as well as a small amount of mucous discharge between menstrual periods, both of which decrease after menopause To prevent any odor from these secretions it is necessary to cleanse the vulva and perineum thoroughly with soap and water daily If the patient cannot do this for herself, the nurse should do so, as part of general hygienic care A vaginal irrigation or douche is not given unless ordered by the doctor It is never given during or immediately after menstruation or during pregnancy, when premature contractions of the uterus might be caused

The temperature of the solution used should always be carefully tested to avoid burning the delicate tissues of the vagina (Review the anatomy and physiology of the reproductive system )

A vaginal irrigation is given to cleanse and deodorize the vaginal cavity, to relieve pain, congestion, and inflammation

Douche nozzles or tips are made of glass or hard rubber Any cracks or rough surfaces will injure the vaginal membrane, therefore, before being used they should be carefully inspected

In the hospital, sterile equipment is supplied already packaged

In the home, wrap the nozzles in gauze and boil for 10 minutes in a covered container and drain off the water before taking them to the bedside Before using a douche bag, which is usually found in the home, inspect it for leakage and clean the inner surface thoroughly with soap and water

If the vaginal irrigation is to be a sterile treatment, the irrigating

can and tubing, and the pitcher, forceps, solution, nozzle, cotton pads, and perineal pad must be sterile.

*Equipment*

Clean irrigating can or douche bag, with rubber tubing and clamp
Sterile pitcher for preparing solution
2 sterile douche nozzles in container
Solutions ordered (2 to 4 qts, at temperature ordered)

| | | |
|---|---|---|
| For cleansing | 105° to 110°F. (40.5° to 43.3°C.) | Test temperature with bath thermometer |
| For inflammation | 110° to 115°F. (43.3° to 46.1°C.) | |

Douche pan or bedpan with cover
Tissues
Rubber protector with cover
Bath blanket
Irrigator stand
Sterile gauze

*Procedure.* Prepare solution and take all equipment to the bedside. Explain the procedure to the patient, if necessary. Cover the patient with a bath blanket and fold top bedding to the foot of the bed. Place rubber protector and cover under the patient. Place the patient in the dorsal recumbent position and drape as for a vaginal examination.

Hang the irrigating can on the irrigator stand or hold it so that the bottom of the can is not more than 18 inches above the mattress. Allow a little solution to flow into the douche pan to warm the tubing; then run enough solution over the vulva and perineum to cleanse, being careful that the end of the tubing does not touch the pan or the patient.

Clamp off the tubing, attach the douche nozzle, holding it in sterile gauze or cloth while attaching; inspect it for any cracks or roughness.

Separate the labia, gently insert the nozzle up and backward and allow the solution to run slowly, rotating the nozzle so that the solution will reach all folds of the vaginal membrane.

At the end of the treatment, withdraw the nozzle and place it in the container. Remove the bedpan, dry the patient, replace the bath blanket with upper bedding.

*Record:* the kind, amount, and temperature of solution, the character of the return flow, and the reaction of the patient.

*Care of equipment* Rinse the nozzle and basin with cold water Wash, and boil for ten minutes Clean other equipment and bedpan in the usual manner

*Precautions in venereal disease* When a gonococcal or syphilitic infection is present, care must be taken to avoid getting the infection or carrying it to others The nurse should wear a gown and rubber gloves She should be extremely careful to avoid getting infectious material in her eyes Goggles are a safeguard She must caution the patient against touching the perineal area, to prevent carrying infection to her eyes All utensils must be boiled for twenty minutes immediately after using Immediately after giving the treatment, the hands must be washed thoroughly under running water

*Note* The vaginal irrigation should not be self-administered unless so ordered by the doctor, and then the patient needs to be properly instructed in the procedure The dorsal recumbent position is necessary so that the douche nozzle may be inserted at the correct angle for safety and effect The flow of the solution must be controlled by having the can or bag no more than 18 inches above the vaginal orifice, so that there is no risk of stronger pressure forcing the solution into the mouth of the cervix

## COLOSTOMY IRRIGATION IN THE HOME

Colostomy is an opening made by the surgeon through the abdominal wall into the colon to permit the expulsion of fecal matter To establish regular elimination, the physician orders the proper diet as well as irrigation

A colostomy irrigation consists of cleansing the tract with warm water or other solution as ordered by the physician The evening is considered the most favorable time for the procedure (See discussion of Care after Colostomy, Chap 51, "Malignant Tumors")

Sometimes the patient is taught while he is in the hospital to do his own irrigation This saves him embarrassment and distress and it enables him to adjust more quickly to the necessary changes in his daily routine

Two kinds of apparatus and belt for colostomy irrigations and dressings are available in medical and surgical supply houses—the Carhart and the Binkley Illustrated directions come with each of these combinations Many patients find them satisfactory

The following procedure is intended to be followed in the home and can be given with improvised equipment.

To give a colostomy irrigation

*Equipment*

Rubber or plastic apron or sheet
2-qt irrigating can or bag
Funnel, 4 ft of rubber tubing, clamp, and glass connecting tube
Rubber catheter, No. 18 French
Quart pitcher of prescribed solution (usually tap water)
Waste basin
Petroleum jelly
Paper napkins
Gauze for dressing
Clean binder
Adhesive

*Procedure.* Collect equipment. Pour water or solution ordered at 105°F. (40.5°C.) into the pitcher.

If the patient is able, have him sit on the toilet in the warm bathroom.

Fasten the plastic apron below the colostomy incision, with the free end of the apron extending into the toilet.

Fill the irrigating can with the solution.

Hang the irrigating can no higher than 18 inches above the colostomy opening.

Lubricate the catheter, open the clamp, and allow some of the solution to run through slowly to expel any air from the tube. Close the clamp.

Insert the catheter into the colostomy opening about 4 inches.

Open the clamp and allow the solution to run in slowly until about a pint has entered the bowel. Then clamp off the tube and wait for the feces to be expelled into the toilet.

Repeat the procedure allowing the solution to run slowly until it becomes clear. Remove the catheter slowly and place it in the waste basin. The irrigation may take from 45 to 60 minutes and it should never be hurried.

Cleanse the area surrounding the colostomy incision with soap and water, and cover the opening (*stoma*) with a clean dressing, to be held in place by adhesive, Scotch tape, or a colostomy binder.

Clean all the equipment thoroughly with soap and water and return it to its proper place.

If the patient is in bed, have him lie on his side near the edge of the bed and fasten the plastic apron or sheet below the incision. The flow is directed into a pail or other receptacle, placed on the floor.

Because of individual variations, each patient with a colostomy must learn through experience how to care for his colostomy, the food which is best for him to eat, and the type of dressing with which he feels most secure. However, he can get help and encouragement by reading accounts of others who have solved similar problems.*

## *SUMMARY*

An irrigation is a continuous flow of water or special solution applied to a certain part of the body or to a body cavity for the purpose of applying moist heat or for cleansing the cavity.

Irrigations should be performed only by experienced nurses, since there is danger of spreading infection and of harming delicate tissues. Handwashing should be done thoroughly both before and after giving this treatment.

The irrigations covered in this chapter are the throat irrigation, the vaginal douche, and the colostomy irrigation. Bladder irrigation is described in Chapter 32, "Elimination of Body Wastes," since it is closely associated with catheterization. Colonic irrigation is described in the same chapter.

### Questions

1. What is another name for an irrigation of a body cavity?
2. Why should irrigations be given only by an experienced nurse?
3. Discuss the importance of handwashing in connection with irrigations.
4. What difference does it make how high the irrigation can is suspended?
5. In a throat irrigation, what happens if the nozzle touches the back of the throat?
6. At what times is a vaginal irrigation not given?
7. What data should be recorded after a vaginal irrigation?
8. Discuss the need of precautions in venereal disease.
9. For what irrigation are the Carhart and Binkley apparatus used?

* Hirshfeld J W, and Sutton H B. A New Colostomy Protector, *Am J Surg* 84 126 (July) 1952. Jaffe Lela. The Patient and His Ileostomy, *Am J Nursing* 54 68 (Jan), 1954. Secor, Sophia M. New Hope for Colostomy Patients. *Nursing Outlook* 2 642 (Dec), 1954.

# 34

# APPLICATIONS OF HEAT AND COLD

The body is provided with a heat-regulating mechanism which in health will warm or cool any part in order to keep an average balanced temperature of 98.6°F. (37°C.). Moreover, the body tends to repair any injury, disease, or malfunction by extra circulation of blood to the part. (Review Chap. 9, "The Circulatory System.")

Heat and cold are applied externally to aid natural functioning of the body. They are the oldest treatments known. The sun's rays, hot and cold water, steam, and moist packs have been used since the days of cave men, and patients seem instinctively to like and to respond to them. Modern therapies make use of electrically produced heat, with sun lamps, inhalators, bakers, electric pads, and other appliances.

Heat may act either as a stimulant or as a sedative, according to its temperature, the duration of the application, and the area to which it is applied. Moderate heat relaxes; high heat applied locally for a short time stimulates contraction. Generally, heat is used to dilate blood vessels and increase circulation to a part.

The application of cold is indicated when blood vessels may be already dilated and there is excess fluid in the part, as in a sprain, or when it is necessary to check the supply of blood to a part in order to retard or prevent suppuration, as when there is danger of an

abscess forming. Cold is generally used to contract blood vessels, and to lessen the supply of blood to a part.

The nurse should never take the responsibility of applying heat or cold as a treatment without a specific order from the doctor.

## *HOT APPLICATIONS*

Heat is applied for the following reasons:

1. To make the patient comfortable
2. To increase the blood supply to a part and so increase cell activities
3. To draw blood from an inflamed area by increasing the supply to another part of the body, thus relieving congestion
4. To induce the formation of pus or suppuration
5. To promote exudation and drainage
6. To soften the tissues and relieve tension, stiffness, and pain
7. To stimulate the growth of new tissue

### DRY HEAT

Dry heat is most commonly used to relieve pain and inflammation. It is applied by means of hot-water bottles, electric pads, or infrared lamps.

Hot-water bottles. To fill, draw the hot water in a pitcher and take temperature with a bath thermometer; never draw water into bottle from faucet.

The hot-water bottle should be preheated by filling with hot water before the final filling.

For a conscious adult the temperature should be 124°F. (51.1°C.); for an unconscious patient, 120°F. (48.8°C.); and for a child, 110° to 115°F. (43.3° to 46.1°C.).

Fill the bottle one-half to three-quarters full, according to the amount of weight a patient may be able to endure. Sometimes the patient can not bear any weight, and the bag must be suspended on a cradle over the affected part.

Lay bottle down and allow water to fill neck. Then place stopper on and screw firmly. By using this method, no air can enter the bottle; it is lighter in weight and more comfortable for the patient

than a distended bottle, which will not conform to all surfaces of the body. Wipe bottle dry and turn upside down; hold it a moment to be sure it does not leak. Place in flannel cover or improvise a cover by tying two corners of a towel around the neck of the bottle. Fold in the sides, bring up other end to cover the end of the bottle, and tie this around the neck on other side.

To *put away*, empty, hang upside down to drain, dry out neck and stopper to prevent rusting. When dry, fill with air and screw on the top. Hang in place.

*Dangers in using hot-water bottles.* A patient may be burned because of carelessness or neglect in testing the temperature. A burn does not heal readily when a patient's vitality is lowered by illness, and infection may occur. Do not remove the flannel cover of the bottle, even if requested to do so by the patient. In many hospitals, hot-water bottles are used only when ordered by the doctor.

Always watch the skin for redness, and never leave a hot-water bottle with an unconscious, paralytic, or sleeping patient without closely supervising and frequently changing the position of the bottle. Watch for leakage.

When putting a hot-water bottle in an infant's bed, wrap it in several thicknesses of flannel or a blanket, and place it where it will not come in contact with any part of the infant's body.

Never apply heat in any form to the abdomen without the order of a physician. The reason is that the pain may be due to an abscessed appendix, and heat would cause a rupture of the abscess.

Electric pads and electric blankets are used in the home, but not in the hospital. It must be remembered that the temperature is likely to increase when the current is left on for some time. *The regulator should be turned to "low" heat and frequently inspected.* The pad should always be covered with a pillowcase or towel before applying. Care should be taken not to let water get on any electrical apparatus, as it will cause a short circuit.

Electric bakers are fitted with electric bulbs and adapted to any part of the body. They are used for applying dry heat in diseases such as arthritis and neuritis.

In using any electric equipment, make sure of the current. If you attach apparatus made for alternating current only to an outlet for direct current, you will blow out a fuse and perhaps damage the equipment.

Infrared lamp treatment is given to relieve discomfort and tension in deep muscle tissues

*Equipment*

Infrared lamp
Bath blanket

*Procedure* Place the patient in a comfortable position Cover with the bath blanket and expose the part to be treated Plug in the lamp and adjust at a distance which will give the maximum degree of heat comfortable to the patient The lamp should never be placed closer to the part than 18 inches It may be adjusted directly over the part or to one side, with the heat rays passing horizontally over the part Continue the treatment from 20 to 30 minutes, or as ordered At the end of the treatment, cover the part treated from 20 to 30 minutes with a blanket or upper bedding to prevent chilling

*Record* area treated length of treatment, distance of lamp from the skin, and the reaction of the patient

## STEAM INHALATIONS

Moist or steam inhalations are ordered when it is necessary for the patient to breathe warm, moist air for a period of time Although plain steam can be used, a drug is sometimes prescribed to be mixed thoroughly with the boiling water

The purposes for which inhalations are given are to relieve inflammation and congestion of the mucous membrane of the larynx and nasal passages, to loosen secretions to soothe irritation, and to relieve coughing and spasms

There are several methods of giving steam inhalations Those described in this chapter include (1) with the electric inhalator, (2) with an inverted paper bag over a pitcher of boiling water, and (3) with a croup tent (for a child)

Steam inhalation electric

*Equipment*

Electric inhalator
Tepid water
Compound tincture of benzoin (if ordered)

*Procedure* Fill bottle of inhalator with tepid water Fill the cup two thirds full of tincture of benzoin (if ordered) Take the inhalator to the bedside

Make the patient as comfortable as possible and instruct him to inhale through the mouth freely. Be sure to protect the patient from drafts.

Attach the cord, and time the treatment from the time steaming starts. Be sure that the nozzle is from 18 to 24 inches from the patient to prevent a burn. Continue for 20 minutes or as long as ordered, checking frequently to be sure the patient does not faint or is not too warm.

*Record:* time, length of treatment, and effect on patient.

*Care of equipment.* If treatment is to be continued, leave the equipment set up. Otherwise, empty benzoin from cup, adding first a small amount of milk of magnesia to aid in removal of the drug. Empty the water carefully, using rubber-tube siphon, if convenient. Leave clean and dry.

**Steam inhalation using paper bag inverted over pitcher of water**

*Equipment*

| | |
|---|---|
| Basin | Tissues |
| Pitcher of boiling water (when benzoin is added to water, use old kettle or tin can, as benzoin stains the container) | Drug as ordered |
| | Paper bag |
| | Large turkish towel |
| | Cold cream |

*To prepare paper bag.* Cut hole in bottom of bag just large enough to admit the nose and mouth. Slip the top part of the bag over the pitcher and adjust it so that no air will enter from the bottom.

*Procedure.* Put boiling water in pitcher, add drug, and stir to mix thoroughly. Invert the paper bag over the pitcher. Carry in basin to the bedside. Apply cold cream to the patient's face and lips. Have the patient place his face in the bag, over the pitcher. Arrange a turkish towel over the patient's head to prevent the escape of steam.

The patient should be in a comfortable position, protected from drafts. The treatment is generally continued from 10 to 15 minutes, or as long as ordered.

Remove the equipment. Pat the patient's face dry with tissues and place him in a comfortable position. He should be relaxed to benefit from the treatment.

**Croup tent for child.** In the hospital, combined oxygen and humidity tents, called "croupettes," are used. They are made by

different commercial companies by whom full directions are supplied for setting up and storage after use

In the home a canopy known as a croup tent is arranged over the bed A special iron frame can be bought for the purpose, but a canopy can be improvised by using a screen or, in emergencies, an umbrella The canopy must be arranged to localize the steam as much as possible but not to exclude the air which the patient needs

*Equipment*

| | |
|---|---|
| Blanket | Low stand or wooden box |
| Frame or screen | Electric plate |
| Sheet | Metal tray or plate to put under electric plate |
| Safety pins | Kettle with spout (when drug is added to water use an old kettle) |

*Procedure* The child should be lying comfortably in bed

Place the electric plate on a low stand or box on one side of the bed, near the head Drape the frame or screen or umbrella with a blanket and pin it firmly The blanket will absorb moisture which might otherwise condense and drop on the patient A sheet may be pinned over the blanket

When a screen is used as a foundation, stand it behind the bed with the wings folded around each side Fasten a heavy cord or rope across the front of the screen to each wing to serve as a support for the blanket Then pin the blanket in place, thus making a tent with the opening in front Cover this neatly with a sheet, and pin the sheet in place

Fill the kettle two thirds full of boiling water, pour in the required amount of drug, mix thoroughly, and place on the plate with the spout directed toward the opening of the canopy Be sure the steam does not come near enough to scald the patient

A good tent can be improvised by using an umbrella Place the open umbrella over the patient's head and fasten the handle securely to the head of the bed This is easier when there are upright bars, as in a crib or metal bed A large double blanket is draped over the umbrella with the ends of the blanket hanging down at each side and kept in place by pinning it to the mattress

*Precautions* Children have received bad burns by upsetting the hot water Never leave the child alone in the room

Guard against the bedclothes touching the electric plate A metal screen should be used around the electric plate

Be careful to have a firm foundation under the plate, so it will not tip over if the table or stand is jarred.

Be sure to have a tray or plate under the electric plate.

Keep children out of the room, as you cannot give an inhalation properly and look after a child at the same time.

Take care not to scald the patient.

After any inhalation the mucous membrane and blood vessels are relaxed; therefore, care must be taken to keep the patient warm and away from drafts. He should not go out of doors for several hours, as he is susceptible to cold and may have a more severe attack of his illness.

## HOT PACKS, STUPES OR FOMENTATIONS

A hot pack is the application of moist heat to a part of the body to relieve pain and congestion; or to ease stiffness of the joints.

*Equipment*

- Bath blanket or bath towel, depending on part to be treated
- Lubricant
- Binder and safety pins, if needed
- 3 pieces of old flannel, large enough to double over the entire area to be treated
- Oiled muslin or wax paper
- Stupe wringer
- Basin with rubber or bath towel to cover
- Boiling water

*Note:* In the home a stupe wringer is made of heavy canvas materials or a bath towel, with 2-inch hem at each end, through which pieces of broomstick of suitable length are inserted. A clothes wringer is more convenient for large pieces of flannel.

*Procedure.* Explain the procedure to the patient. Place him in a comfortable position and lubricate the area to be treated. Bring dry equipment to the bedside—bath blanket or towel, dry flannel, oiled muslin or waxed paper—and arrange conveniently.

In the kitchen or utility room have the water boiling. Place one piece of flannel in the stupe wringer. Immerse the stupe wringer with flannel in basin of boiling water and wring dry with the stupe wringer.

Remove the sticks from the wringer, pour off the water; place the wringer (with flannel) in hot basin, cover with rubber, and carry

basin to the bedside Shake the flannel to remove the steam Apply gently to the area, raising the flannel several times at the corners to permit escape of heat Be especially careful not to burn the skin

Wrap snugly with oiled muslin or wax paper, dry flannel, and bath towel or blanket, and cover with upper bedding

Change every 10 minutes, or as ordered, for the required length of time, bringing the second piece of flannel wrung out in stupe wringer to the bedside and changing as quickly as possible When the treatment is completed, pat dry, cover with dry flannel held in place with binder, if necessary, and leave covered 20 to 30 minutes to prevent chilling

*Record* kind and duration of treatment, and the reaction of the patient Note if the skin is unduly reddened or shows signs of blistering

*Care of equipment* Clean utensils and return to proper place Wash and dry stupe wringer and flannels between treatments Launder when treatment is discontinued

To give a turpentine stupe This stupe is given to relieve distention caused by gas in the intestines

*Equipment* The equipment is the same as for the hot pack with the addition of a small container for solution of turpentine and mineral or sweet oil 1 tsp of turpentine to 4 tsp of oil (For children 8 to 10 tsp of oil to 1 tsp of turpentine )

Large applicator
Rectal tube
Emesis or waste basin
Bedpan cover

*Procedure* Explain the procedure to the patient Fold the bedding down over the abdomen and the gown up over the chest Cover the chest and abdomen with a folded bath blanket

Insert a well lubricated rectal tube Place the free end in the basin and cover with the bedpan cover

Prepare the patient and stupe as in the previous procedure Paint the abdomen with a carefully blended mixture of oil and turpentine Apply the stupe and cover as before Continue the treatment from 20 to 30 minutes, changing the stupe once or twice

When the treatment is completed pat the area dry and cover with dry flannel Leave the rectal tube in place from one half to one hour following the treatment Replace the top bedding and leave the patient comfortable

*Record:* the time given, the kind and duration of treatment, the local effect on the skin, if any, and whether or not distention was relieved by passing flatus.

Hot compresses for eyes. Hot compresses may be ordered for the eyes to relieve pain, congestion, and inflammation.

*Equipment for doing the treatment in the home*

- Small sterilized basin or bowl in which the solution ordered may be heated to the boiling point
- Package of sterile cotton balls (which may be purchased)
- Forceps in the container in which they are boiled
- 2 tongue depressors, placed in the basin (while solution is being heated) so that one end of each is outside the lip of the basin
- Tube of white petroleum jelly
- Paper bag
- Rubber protector, with face towel to cover

*Procedure.* Place the rubber protector covered with the face towel over the pillow. Place the patient in a comfortable, prone position. Have the solution at the boiling point and bring the tray to the bedside. Scrub your hands. Open the package of sterile cotton balls. With the forceps place several cotton balls in solution. Instruct the patient to close his eye; lubricate the eyelid and the cheek below the eye with petroleum jelly. Protect the other eye with a clean handkerchief. Squeeze a cotton ball between the tongue depressors and apply the moist cotton ball to the eyelid. Have the cotton ball as warm as the patient can tolerate. When the compress feels cool to the patient, discard it in the paper bag and apply a warm one. Continue for the length of time ordered. Discard the tongue depressors in the paper bag.

*Record and report:* time and length of treatment, solution used, appearance of eye at end of treatment, and effect on patient.

*Care of equipment.* Wrap waste material and discard. Clean all equipment used and return to proper place. Boil basin used for solution for 20 minutes.

## POULTICES

A poultice is a preparation of water and some thickening substance, as meal, which is boiled to a consistency easily spread on cloth or paper. Flaxseed is the most common substance used, although

bread may be substituted. The advantage of using flaxseed is that it retains heat longer than other substances and also holds air, which makes the poultice lighter.

Poultices are frequently prescribed for pain, inflammation, or congestion, and for inducing suppuration.

Flaxseed poultice

*Equipment*

- Flaxseed
- Soda bicarbonate
- Petroleum jelly
- Saucepan
- Boiling water
- Mixing spoon
- Teaspoon
- Applicator or throat stick
- Platter or board
- Piece of soft cotton cloth the size of area to be covered
- Piece of cotton cloth 2 in larger than area
- Bath towel
- Oiled silk or waxed paper
- Basin or dish

*Procedure.* Arrange bath towel and oiled silk or waxed paper in dressing basin ready to carry to bedside.

Place larger cloth on platter or board.

Put in saucepan enough water to make required-size poultice. When water is boiling hard, add flaxseed slowly and stir constantly to prevent lumps.

Boil until mixture is of a consistency to drop from the spoon, leaving it clean. Remove from stove at once, add soda bicarbonate, and beat mixture vigorously to make it light but not long enough to cool it.

Cut wax paper to size and place on piece of cloth or compress. Spread poultice evenly on wax paper and fold margin of cloth over edges. Cover with second piece of cloth and fold all edges under.

Place poultice in oiled silk or waxed paper and wrap in towel. Place in dressing basin with jar of lubricant and applicator.

If the poultice is boiling hot and if it is not very small, you will have time before taking it to the patient to fill the saucepan with cold water, as it is very hard to clean if the flaxseed is allowed to dry on the pan.

Carry poultice to bedside. Fold back bedclothes from area to be poulticed. Turn back nightgown and remove any swathe or bandage.

With applicator, spread area thoroughly with lubricant to avoid burning the skin. Before applying poultice, test on your wrist to make

sure that it is not too hot. Test on your face before using on an unconscious patient or infant.

Apply poultice gradually, lifting from side to side to allow steam to escape. To get best results, the poultice should be as hot as the patient can endure.

Cover poultice with oiled silk and bath towel. The poultice may be held in place with binder or bandage if necessary. Remove poultice before it becomes cold.

After removing poultice, pat the skin gently until dry. Then apply petroleum jelly with applicator to the poulticed area. Cover part with towel or flannel, and keep in place with binder or bandage.

Be sure to watch the skin for excessive redness, and report as soon as observed.

Wash and put away utensils. Never allow any flaxseed to enter the drain, as it will clog the pipes.

Wrap used poultice in newspaper for disposal.

*Record:* Area to which applied and the effect on the patient.

Mustard paste is prepared with mustard, flour, and tepid water.

*Equipment*

| | |
|---|---|
| Flour | Mixing bowl |
| Mustard | Platter or board |
| Cottonseed oil or petroleum jelly | Piece of cotton cloth (required size) |
| | Gauze or tissue paper |
| Applicator or throat stick | Towel |
| Dessertspoon | Hot-water bottle |

*Procedure.* To make for an adult, add 1 dessertspoonful of mustard to 3 or 4 dessertspoonfuls of flour.

For a child, add 1 dessertspoonful of mustard to 6 or 8 dessertspoonfuls of flour.

Mix dry ingredient together in bowl and add 1 dessertspoonful of oil.

Add enough tepid water to make a paste that can be spread easily. This amount will be sufficient for a poultice about 6 inches square. Use more or less material in same proportions for larger or smaller poultices.

Lay poultice cloth on board and spread paste with teaspoon to about ½-inch thickness. Cover with tissue paper or gauze (which

comes next to skin) and fold edges of lower cloth over top Carry poultice to bedside on hot-water bottle covered with towel Using applicator, lubricate prescribed area with oil or petroleum jelly, apply poultice, and cover with towel to hold it in place and to protect clothing Do not cover tightly, as it is necessary to watch the skin As soon as the skin becomes red, which usually takes about ten minutes, remove the poultice Since some sensitive skins blister before they redden, great care must be used

Pat skin dry, apply oil or petroleum jelly, and protect from friction of bedclothing

*Record* area to which applied, length of treatment, and local effect

## BATHS

**To give a foot bath.** A foot bath is given to cleanse, to improve circulation, and to relieve pain, congestion, and inflammation

*Equipment*

- Large bath basin, ½ to ⅔ filled with solution as ordered, at a temperature of from 100° to 105°F (37 7° to 40 5°C )
- Pitcher of solution at 110°F (43 3°C )
- Rubber pillow case
- Large rubber sheet
- Bath towel
- 1 or 2 bath blankets

*Procedure* Arrange bath blanket over patient, fold bedding to the foot of the bed Put the rubber-covered pillow under knees for support Protect the bed with a large rubber sheet and a bath towel, and place bath basin on them Place the patient's feet in the basin, being careful to avoid pressure of basin against the leg

After 10 minutes, lift the patient's feet out of the basin, add solution from pitcher to maintain the temperature, and replace the feet Allow the feet to remain in the bath for 10 minutes more

Remove the feet from the bath, dry thoroughly, especially between the toes Keep covered by bedding for 20 minutes to prevent chilling

If the patient is able, he may sit on the side of the bed with the basin on a chair or stool In this event, place bath blanket around

his shoulders and another around his knees, and protect the chair or stool with newspapers.

*For a mustard bath,* use 1 tbs. of mustard to 1 gal. of water. Put the mustard in a compress bag; tie securely; squeeze dissolved mustard into water. Discard mustard bag before taking the equipment to the bedside.

*Record:* Type and temperature of solution, length of treatment, local and general effect on patient.

*Care of equipment.* Pour solution into hopper, wash basin and rubber sheet, and put soiled linen down laundry chute.

To give an arm bath. The purpose of an arm bath is to relieve pain, congestion, and inflammation.

*Equipment*

Arm bath basin with cover, about ½ full with solution as ordered, at a temperature of from 100° to 105°F. (37.7° to 40.5°C.)
Pitcher of solution at 110° F. (43.3°C.)
Small Cellucotton pad
Large rubber sheet
Bath towel

*Procedure.* Preheat basin by rinsing in hot water. Fill with solution. Place the patient comfortably, well-supported by bed and pillows. Turn bedding down to waist and place rubber and towel on bed. Place arm basin securely on rubber sheet and towel; immerse arm and replace cover. Put small pad under arm at the edge of the basin. Fold rubber sheet and towel over basin and replace upper bedding to retain heat.

After 10 minutes test temperature and add more solution at 110° F. (43.3°C.) if necessary. (Some of the solution in the basin may have to be removed by dipping out a small amount.)

Allow the arm to remain in the bath for 10 to 15 minutes more, or as ordered. Remove from bath; pat dry with towel, and instruct the patient to keep the arm covered with bedding for 10 to 15 minutes to prevent chilling.

*Record:* type and temperature of solution, length of treatment, and effect on patient.

*Care of equipment,* as for foot bath.

To give a sitz bath. A sitz bath is given to apply local heat, to promote healing, to relieve pain, congestion, and tension, and sometimes to stimulate micturition.

*Equipment*

Tub of water at 105°F (40.5°C) filled so that the water will come above the hips. Gradually increase the temperature of water to 115° to 120°F (46.1° to 48.8°C), according to the comfort of the patient
3 bath towels
Wheel chair
Safety pins
Stool

*Procedure* Check temperature of water. Place folded towel in tub. Remove patient's robe, slippers, and gown, and pin bath towel around shoulders. Assist the patient into tub. He should sit comfortably with his knees flexed. Have the room properly ventilated, ensure privacy, and leave a call bell within easy reach. Let the patient remain in the tub for 10 to 15 minutes, unless ordered otherwise. Check patient frequently.

Assist the patient from the tub to seat or stool covered with a bath towel. Dry the body well. Replace gown and slippers, assist patient to wheel chair, protect him from chilling, and take him to his room at once. The patient should remain in bed for at least one hour following the bath.

*Record* temperature of bath, length of treatment, and effect on patient at end of bath and one hour afterward.

*Care of equipment* Clean the tub thoroughly and leave the bathroom in order. Put soiled linen down the laundry chute.

A temperature or sponge bath is a quick sponging of the body with cool or tepid water. It is given to refresh the patient, to relieve restlessness, or to reduce temperature. The temperature of a sponge bath varies with the reason for which it is given.

*Equipment*

2 bath blankets
Bath towels
Face towels
2 washcloths (1 yd square of gauze makes a better sponge than does a washcloth)
Bath basin filled with water at required temperature
Ice bag, if ordered
Bathing alcohol
Powder

*Procedure* Bring equipment to bedside and arrange conveniently. In giving a sponge bath, it is much easier to have the table at the nurse's right, to avoid extra motions. Be sure the room is warm and free from drafts. Cover patient with bath blanket. Turn upper bedclothes in folds to foot of bed.

Remove nightgown and slip blanket under patient, as in bed bath. Take temperature and pulse if necessary.

When the sponge bath is given to reduce temperature, an icecap should be applied to the head.

Do not wring out cloth as much as in bed bath, but alternate cloths frequently. Bathe face first, then dry. Sponge for 4 minutes half the chest, one arm, and leg; then the other half of chest, other arm, and other leg for 4 minutes; then entire back for 4 minutes. The abdomen is not sponged, but a cloth wrung out nearly dry may be placed over it. This is changed between the mentioned four-minute periods.

Use long, firm upward strokes, always sponging in the direction of the heart. This dilates the superficial blood vessels and cools the surface tissues, thus forcing the blood to the deeper vessels where it is again heated.

Since the cooling of the body is caused not only from the cool or tepid water but also from evaporation, it is best to expose the part of the body which is being sponged.

If the bath is given to reduce temperature, the patient's temperature is taken and recorded before the bath and half an hour afterward. The quality of the pulse is also noted.

During the bath the patient's condition is closely watched. If he shivers or becomes even slightly cyanotic, the bath should be stopped, and he should be wrapped in a hot blanket. If ordered, a hot-water bottle may be put in the bed. This condition shows that the patient has failed to react normally and it should be reported at once to the physician or head nurse.

Remove icecap as soon as sponging is finished. Do not dry patient until the sponging is completed. Sometimes the patient is not dried at all but left for a few minutes covered with the blankets. The patient may then be rubbed all over with bathing alcohol and powdered.

Remove both blankets, put on nightgown, replace upper bedclothing.

The alcohol sponge bath is the same as the temperature bath except that the bathing basin is filled with equal parts of water and bathing alcohol at required temperature.

Medicated baths. A medicated bath, in which a drug is added to the water, is given for various purposes, such as skin affections,

to improve the circulation, and to relieve congestion The temperature of the bath depends on the purpose for which it is given

Cornstarch baths are given to soothe irritation of the skin The temperature of the bath is 93° to 96°F (33 8° to 35 5°C ) Dissolve 2 level cupfuls of cornstarch in cold water Add boiling water slowly to make a thick paste Then add to a tub of water The patient usually stays in the tub about 20 minutes Do not rub dry, but pat gently, allowing the starch to dry on the skin

Bran baths are sometimes given to soothe irritation A cheesecloth bag is filled with about one pound of bran Put a bag in the bath and shake it around until the water becomes milky The temperature is usually 95°F (35°C )

Oatmeal baths are sometimes ordered to relieve skin irritation Place 2 cupfuls of cooked oatmeal in a bag made of several thicknesses of gauze Add to a tub of water at the required temperature The patient remains in the tub the length of time ordered To dry, pat gently with a soft towel, do not rub

Sodium bicarbonate baths are given to relieve itching of the skin Dissolve 2 heaping cupfuls of soda in a tub of water at a temperature of 95°F (35°C )

To give a hot-wax treatment The purpose of this treatment is to supply heat and relieve stiffness It is usually given to arthritic patients, around swollen joints

*Equipment*

| | |
|---|---|
| 2 qt pitcher | Flannel large enough to wrap part |
| 4 lb wax | Bath towel or bath blanket |
| Paintbrush | 2 clothes tags with patient s name and room number |

*Procedure* Place the wax in the pitcher Place the pitcher in basin of boiling water and melt Then allow wax to cool to a temperature of 120°F (48 8°C ) The pitcher could be about three-fourths full of melted wax, if the hands are to be immersed

Empty the water from the basin place the pitcher in the basin and take to bedside with other equipment

Explain the procedure to the patient, and arrange the patient in a position which will be comfortable for the duration of the treatment Instruct him to place his hand in wax up over the wrist, withdraw, allow to harden a few minutes then immerse again Repeat if necessary until a thick glove of wax has formed

Wrap closely with flannel, then with bath towel or bath blanket. Leave wrapped from 30 to 60 minutes, or as ordered.

For parts which cannot be immersed, such as knees, shoulders, or feet, paint the coating of wax on with a paintbrush and proceed as above.

At the end of the treatment, peel off wax glove or coating and replace in pitcher.

Keep the part which has been treated well covered from 20 to 30 minutes.

*Record:* type, temperature, and duration of treatment and local effect.

*Care of equipment.* Roll towel or blanket and flannel together and attach tag with patient's name and room number. Include brush, if used. Tie other tag to top of pitcher handle and keep with flannel in utility room for further treatments. When treatments have been discontinued, melt the wax, pour into a bag made of several thicknesses of newspaper, and discard. While the pitcher is hot, wipe out the remaining wax with a paper towel or newspaper. Wash pitcher in hot soapy water. Discard flannel and brush. Avoid getting wax on bed linen, blankets, sinks, and the like.

## SOAKS AND WET DRESSINGS

**Hot soaks for the foot or hand.** Hot soaks for the foot or hand are sometimes ordered:

1. To relieve pain
2. To reduce inflammation
3. To limit the spread of infection (by increasing the number of white cells carried to the site of infection)

A soak consists of hot water at a specified temperature to which an antiseptic substance, such as salt, chlorinated soda, bichloride of mercury, or Epsom salts, may be added.

Since the soak is given for the purpose of applying continuous heat, it is important to keep the solution as hot as can be endured.

*Equipment*

| | |
|---|---|
| Foot tub or deep basin | Paper bag |
| Rubber sheet | Forceps |
| 2 bath towels | Pail |
| Pitcher of solution at temperature ordered | |

*Procedure* The patient should be in a comfortable position, either supported by pillows in bed or in a chair The basin or tub can be placed on a table or on the bed near the patient Protect the table or bed with the rubber and towel Fill the tube or basin with solution Remove the bandage and dressing, discard in paper bag Gently lower hand and arm (supporting wrist) and elbow into the solution

Place a folded towel over the edge of the tub to make the part resting against the edge more comfortable Cover the tub with a bath towel to keep in the heat The soak is usually ordered to last from 20 minutes to an hour

Have a hot solution of the same strength to replenish It will probably be necessary to dip out some of the used solution into a pail, as the tub must be about two thirds full to have the soak effective

Prepare material for the dressing, if ordered, and have it ready on the bedside table Place a towel on the bed at the side of the patient Lift the arm from the solution and place it on the towel Fold the towel over the arm and remove the tub

Apply dressing and bandage, or pin the towel around the arm Apply a sling, if necessary

To give a foot soak in bed, prepare the solution and dressing if ordered, as above Then proceed as in foot bath The temperature of a foot bath is usually 105° to 110°F (40 5° to 43 3°C ), as the foot is more sensitive to heat than is the hand

A sterile hot soak followed by sterile dressings is often given before or after operation but generally is not administered by the practical nurse, since this procedure is the province of nurses trained in operating room technique

Hot wet dressings are sometimes ordered to follow a soak or are used instead of a soak

*Equipment*

| | |
|---|---|
| Sheet wadding or absorbent cotton | Solution |
| Parchment or waxed paper | Pitcher |
| Towel or stupe wringer | Safety pins if necessary |
| Dressing towel | Sling if necessary |
| Basin | |

*Procedure* Fill the pitcher with solution at required temperature Place towel or stupe wringer over basin with the ends hanging over

the edge. Place pad or gauze in towel. Pour solution over pad until it is saturated. Take the ends of the towel and twist tightly in opposite directions.

Open towel, remove pads, and place quickly on the area. Cover with sheet wadding and wax paper to keep in heat and moisture. Cover with towel and fasten with safety pin. A many-tailed bandage is useful in keeping the dressing in place.

Have the arm or leg in a comfortable position, resting on a rubber-covered pillow. It is easier for the patient if the arm or leg is slightly elevated, as the elevation will prevent pressure of the blood on the inflamed part.

## *COLD APPLICATIONS*

Cold is applied for the following purposes:

1. To check congestion and inflammation
2. To relieve pain
3. To check bleeding
4. To lessen discoloration
5. To prevent swelling

Cold applications, if not prolonged, have the opposite effect of hot applications. They check the activity of the cells and the bacteria and lessen the blood supply to a part, as well as diminish the sensitiveness of the nerve endings. Prolonged cold applications can bring about an effect similar to the application of heat.

The most common methods of applying cold are by icecap and cold compresses.

Icecap or bag

*Equipment*

| | |
|---|---|
| Icecap or bag | Gauze or towel to cover icecap |
| Ice cubes | Safety pins |
| Tablespoon | Basin |

*Procedure.* Place the cubes in a colander or strainer under running water to round off the sharp edges and make the cubes smaller in order to avoid discomfort to the patient and to prevent cutting the rubber.

Cover the bottom of the bag with the cubes, but do not pack it full of cubes for it will be too heavy for the patient to bear. Lay the bag on a flat surface and expel the air. Then screw the metal cap on tightly and wipe dry. Test for leakage. Cover with a piece of gauze and tie the ends neatly over the cap. A dressing towel may be used, folded over the bag and pinned in place with safety pins. The pins should be over the upper part of the bag where they will not come in contact with the patient. Avoid pricking the bag, as one pinprick will make it useless.

When the patient cannot bear the weight of the bag, as in heart disease, it may be suspended over the part by a swing made of bandages attached to a bed cradle placed over the patient. The bag should be as near the prescribed area as possible.

*To put ice bag away.* Drain out, put a towel inside the cap to absorb the remaining moisture, and let it stand for a while. Then dry thoroughly, screw on metal cap, allow some air to remain in the bag, and put it away. It is advisable to put a piece of gauze inside the bag before putting it away. Be sure the washer is on the metal cap, as it may be needed in a hurry. Put the bag away in a box.

*Caution.* The point to remember is that, since cold is applied for its continuous effect, it is important not to allow cold applications to become lukewarm. The area to which cold is continuously applied should be carefully watched for redness or frostbite. Cold cream may be patted gently over the area before each application of the ice bag. Causing frostbite is as much a disgrace to the nurse as producing a burn. Icecaps are never used unless ordered by the doctor.

When applying cold to any part of the body, do not allow the patient to become chilled. A hot-water bottle, if ordered, may be placed at the feet; extra blankets may be necessary.

In a private home, when ice cubes are not available, it will be necessary to break small pieces from a cake of ice. To do this you will need an ice pick, mallet, and a canvas bag. Put the ice in the canvas bag, lay it on a hard surface, and pound with mallet.

## COLD COMPRESSES

Moist cold is applied by means of cold, wet compresses made of squares of cotton cloth or absorbent cotton.

Cold eye compresses

*Equipment*

| | |
|---|---|
| Ice | Paper bag |
| Cup of prescribed solution | Dressing towel |
| Bowl | Rubber |
| Gauze | Bath towel |

*Procedure.* Stretch the gauze tightly over the bowl, fasten on with an elastic band. Place ice on gauze. This will allow water to drain into the bowl and keep the ice from melting.

Protect the pillow with rubber and towel, and lay the bath towel around the patient's neck and shoulders.

Bring the equipment to the bedside on a tray covered with a towel.

Dip the compresses in the prescribed solution, and lay on the ice until chilled. Then put them on the eye, one at a time; be careful not to touch the surface which comes in direct contact with the eye.

When one eye is affected, the patient's head should be turned in the direction of the infected eye to prevent the solution from running into the other eye. Discard each compress after use. Always have a few compresses chilling on ice. A compress should remain on the eye only 15 to 30 seconds, as it becomes heated almost immediately.

*In gonorrheal infection of the eye, treatment should be given by a nurse with special training, as the infection is easily spread and the consequences are serious.*

Compresses for the head

*Equipment*

| | |
|---|---|
| Agate basin | Rubbing alcohol |
| Ice | Towel and rubber |
| 2 pieces of gauze or old linen about 18 in. square | Bath towel |

*Procedure.* Pour a small quantity of rubbing alcohol in a basin and add ice. Protect the pillow with the rubber and towel and place a bath towel over the patient's shoulders. Fold the gauze the size of the forehead. Dip in solution, wring out, and lay on forehead. Have the other piece of gauze cooling in the solution; change frequently. Do not allow the compress to become warm. Add ice and solution from time to time, as required.

Never apply either heat or cold without orders from the physician.

## *SUMMARY*

The body in health regulates its temperature to an average of 98.6°F. (37°C.), and it also tends to repair itself by increased circulation to an affected part. The application of heat or cold aids this natural functioning.

Heat may act as a stimulant or as a sedative, depending on certain factors, but it is generally applied to dilate blood vessels and to increase circulation.

Cold is indicated when the blood vessels are already dilated and excess fluid has accumulated or may accumulate in the part involved.

The application of heat—dry or moist—serves several specific purposes and utilizes such appliances as the hot-water bottle; the electric pad, blanket, baker; and the infrared lamp.

Moist heat may be derived from the use of electric steam inhalators, hot packs, stupes and fomentations, hot compresses, dressings, soaks, poultices, mustard pastes, and baths.

The baths include: foot, mustard, arm, and sitz baths. Medicated baths are given for various specific purposes.

Hot-wax treatments relieve arthritic joint conditions.

Cold applications check congestion, inflammation, bleeding, discoloration, and relieve swelling. They are generally made by use of icecaps and bags and by cold compresses.

The sponge bath and the alcohol sponge are comforting and of value in reducing elevated temperatures.

The nurse should never apply either heat or cold without orders from the doctor.

### Questions

1. What three factors govern whether a hot application will act as a stimulant or as a sedative?
2. Name a condition in which an application of cold would be indicated.

3. Give several reasons for the application of heat.
4. How can a hot-water bottle be filled so that no air will enter it?
5. List some precautions which should be taken for the patient in the use of a hot-water bottle.
6. What is the effect of steam inhalations on the bronchial tubes?
7. To what heat should the regulator on an electric pad or blanket be turned if the current is to be left on?
8. For what condition is an infrared lamp used?
9. What medication is often prescribed for use in a steam inhalation?
10. What equipment may be substituted for an electric steam inhalator?
11. Describe how an improvised croup tent may be made.
12. How can a stupe wringer be made in the home? What household appliance is convenient for wringing the flannel used for stupes?
13. Of what are poultices commonly made?
14. Describe a sitz bath.
15. Why are hot compresses sometimes ordered for the eyes?
16. In the home how would you melt the wax for a hot-wax treatment?

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# PART VI

## *Some Common Drugs and Their Administration*

# 35

# ADMINISTRATION OF MEDICINES

A drug is any substance used in the diagnosis, relief, cure, or prevention of disease Drugs may be animal, vegetable, or mineral in origin but once they have been analyzed, and their chemical composition determined, many of them may be made synthetically in the laboratory Other terms used for "drug" are *medicine* and *medication*

The physician prescribes the drug that is to be given to a patient, the dosage, the mode of administration, the frequency with which it is given, and when he wishes it discontinued The pharmacist compounds and dispenses the drug, properly labeled with its name and dosage To the nurse is entrusted the responsibility for procuring the right medication, measuring the correct dosage, administering it to the patient at the proper time and in the proper manner to ensure results, observing the effects, and making an accurate record for the physician

Drugs are prepared, either by physical or chemical means, in a form which will be suitable for administration to get the desired results They may be liquids, solids, or semisolids Some of the principal preparations are

| LIQUIDS | SOLIDS | SEMISOLIDS |
|---|---|---|
| **Fluid extracts**<br>Thick preparations of vegetable drugs in alcohol | **Powders**<br>Finely divided drugs, often given in capsule form | **Suppositories**<br>Drugs in a base, such as cocoa butter |

### LIQUIDS

**Tinctures**
Drugs dissolved in alcohol.

**Elixirs**
*Flavored alcoholic* solution of a drug.

**Solutions**
Drugs dissolved in water.

**Emulsions**
Oil compounded in a solution.

**Mixtures**
Suspensions of drugs in water.

**Sirups**
Drugs dissolved in sugar.

**Lotion (for external use)**
A suspension of a drug in water.

**Liniment (for external use)**
A mixture of drugs with oil, soap, water, or alcohol. Intended for rubbing only.

### SOLIDS

**Capsules**
A gelatinous substance which dissolves in the stomach. Drug is in the capsule. *Usually taste is* bitter so drug should not be removed from capsule.

**Tablets**
Drugs molded and compressed into a disk.

**Triturates**
Very soluble tablets, suitable for hypodermic use.

**Pills**
Drugs molded into a sphere or oval and sometimes covered with a coating.

### SEMISOLIDS

**Ointments**
Mixtures of a drug and a fatty base, such as petrolatum.

## *OFFICIAL AND NONOFFICIAL REMEDIES*

Some preparations are included in the *United States Pha macopoeia,* as they are approved officially by the Pharmacopoei Committee when it meets every ten years. Others, which may prov to be equally good in the opinion of the American Medical Associ

tion, are developed and put into use pending the next meeting of this committee Until they are approved by the Pharmacopoeial Committee they are known as nonofficial remedies

Those proprietary medicines which are considered worth trying are included in the book, *New and Nonofficial Remedies* These medicines bear trade names rather than official names, so that the manufacturer can reap the benefit from its advertising Of course, it is the consumer who always pays for advertising, therefore, proprietary medicines are ordinarily more expensive than others Their promotion is often made by reliable companies, whose laboratories carry on extensive research and make very conservative claims for their products

However, not all patented medicines are marketed on such an ethical and scientific basis Both the physician and his patient are protected to some degree against unreliable medicines by the control over the purity, standards, and composition of drugs exercised under the Federal Food, Drug, and Cosmetic Act

Self-medication is dangerous The remedy used often affords only temporary relief from pain and discomfort When a physician is consulted, he searches for and treats the cause of the patient's condition, and eventually saves him time and money Persons suffering from headaches, backaches, and the like are often misled by medical advertisements whose claims are not justified

## THE FEDERAL NARCOTIC LAW

The Federal Narcotic Law, sometimes referred to as the Harrison Act, regulates the manufacture, distribution, and use of narcotic drugs, specifically opium and cocaine For this reason, the administration of each dose of morphine, cocaine, and all their derivatives must be recorded in the proper books, which are inspected by federal officers at rather frequent intervals Marihuana and derivatives of barbituric acid are also under control Sales of certain poisons must be recorded in the poison book, kept by the pharmacist, who is held responsible if he sells these poisons without discrimination and due precaution Some drugs have been classed as *dangerous*, under the Food, Drug, and Cosmetic Act They cannot be included in proprietary medicines or sold without a doctor's prescription

## *MEASUREMENT OF DRUGS*

Responsibility is given to the nurse for accurately measuring drugs; therefore, she must be familiar with the systems of weights and measures employed: the apothecaries', the metric, and the measures used in the ordinary household. She also needs a workable knowledge of arithmetic.

Apothecaries' system of weights. The units are: grains, drams (ʒ), ounces (℥), and pounds (lb).

Apothecaries' fluid measure. The units are: minims (m), fluid dram (fl dr), fluid ounces (fl oz).

The tables shown give the equivalent of metric and apothecaries' liquid and solid measures and household measures. *The household measures are only approximate and should never be used when an exact amount is necessary.* In the home, when graduated measures are not available, household measures may be used in certain instances, as when household measures are stated in the prescription.

The equipment of the practical nurse should include a small graduated medicine glass.

### EQUIVALENT LIQUID MEASURES

| METRIC SYSTEM | APOTHECARIES' SYSTEM | HOUSEHOLD MEASURES |
|---|---|---|
| 1 cc | 15 m | 15 drops |
| 4 cc | 1 fl dr | 1 tsp |
| 30 cc | 1 fl oz | 8 tsp or 2 tbsp |
| 500 cc | 1 pt | 2 measuring cups |
| 1,000 cc or 1 liter | 1 qt (2 pt) | 4 measuring cups |

The above tables give the equivalent of liquids in metric and apothecaries' systems and household measures

### EQUIVALENT DRY MEASURES

| METRIC SYSTEM | APOTHECARIES' SYSTEM | HOUSEHOLD MEASURES |
|---|---|---|
| 1 gm | 15 grains | ¼ tsp |
| 4 gm | 1 dr | 1 tsp |
| 30 gm | 1 oz | 8 tsp |

The above tables give the solid or dry equivalents in metric and apothecaries' systems and household measures.

## *THE MEDICINE ORDER*

In the hospital the physician writes and signs the order for medication either in the order book at the nurse's station or on a special order sheet attached to the patient's chart To avoid error in the administration of medicine, many hospitals use a card system A card is made up for each order for medicine, bearing the patient's name and room number, the drug and the amount of the drug to be given, as well as the time and method of administration The cards must be printed or written plainly One color may indicate that the medicine is to be given before meals, and another color that it is to be given three times daily Before giving a drug the first time, the nurse should compare the card with the order book or order sheet

**The physician's orders in the home.** It is very important that the physician's orders be written and signed The doctor is generally in a position to write his order but, if he does not do so, the nurse should write it herself and show it to him before he leaves the house If the physician gives his order over the telephone, the nurse should ask him to wait until she can record what he says and then she should ask him to verify his message as she reads it back to him

## *WAYS OF GIVING MEDICINE*

Medicine is administered in different ways, depending on the nature of the drug, the speed of action required, and the condition of the patient Several methods include

| | |
|---|---|
| By mouth | By inunction |
| By rectum | Subcutaneously |
| By inhalation | Intramuscularly |

**To give medicine by mouth.** Medicine is most commonly given by mouth The length of time required for absorption depends upon whether the stomach is empty or full, upon the person, and upon the disease Absorption usually takes from twenty minutes to one hour.

Laxatives which act slowly are given at night and those which act quickly, such as salines, are given in the morning before breakfast

Drugs ordered to stimulate the appetite are given before meals.
Irritating drugs, such as iron, are given after meals.
To measure medicine

1. Use a graduated glass, as spoons vary in size and are not accurate.
2. If drops are ordered, use a medicine dropper.
3. If minims are ordered, use a minim glass or your hypodermic syringe. Remember that minims and drops are not the same size.
4. Never speak to anyone or let anyone speak to you while you are measuring medicine.
5. Be sure you have a good light.
6. Never give any medicine from an unlabeled or indistinctly labeled box or bottle, even if you feel quite sure of the contents.
7. Always return the bottle containing the medicine to its proper place.
8. Never pour medicine back into the bottle or from one bottle to another.
9. Different medicine glasses and tumblers should be used for oils and strong-smelling drugs.
10. Medicines are usually ordered diluted in a given amount of water. Cough medicines are usually ordered undiluted. Their soothing effect on the mucous membrane is lost if they are diluted.
11. Never give medicine which some other person has assembled.

Method of pouring medicine
*Equipment*

| | |
|---|---|
| Graduate glass | Piece of gauze or compress, slightly moistened |
| Pitcher of water | Medicines |
| Drinking glass | Tray or plate |

*Procedure.* Read medicine order. Look at label on bottle when taking from shelf. Shake the bottle before pouring any emulsion or a liquid which has a drug in suspension. Hold the bottle in the *right hand.*

With the right hand, unscrew the cap and lay it down, taking care to place it with the inside facing upward.

If the bottle has a cork, remove the cork with the little finger and fourth finger of the left hand, and hold it thus while pouring. (The cork should never be laid down.)

Look at the label before pouring.

Hold the graduate glass in the left hand, level with the eye, the

thumbnail resting on the mark required, and pour medicine. Be careful to pour from the side opposite the label to avoid staining

Replace the screw cap or cork and wipe the bottle with a tissue or a wet cloth, after measuring the medicine

Look at the label for the third time and replace the bottle on the shelf

Pour the medicine from the graduate glass into the medicine glass and dilute it as ordered Rinse the medicine glass before using it again

Carry the medicine and the glass of water to the bedside on a small tray or plate In diluting medicine, have the water either hot or cold, never lukewarm Check the name of the patient with the medicine order Record the medicine as soon as given

As soon as the medicine is given, graduates and medicine droppers should be washed in hot soapy water, well rinsed, and dried, and everything should be returned to its proper place, as it may be needed in a hurry later on

**To give pills or powder**

*Equipment*

| | |
|---|---|
| Pitcher or glass of cold water | Plate or small paper cup |
| Glass rod or spoon for crushing pills (if necessary) | Medicine |

*Procedure* Bring the pill to the bedside on the plate or in the small paper cup Never carry a pill in your fingers

Pills may be given by placing them well back on the tongue or by crushing them and putting the powdered pill in bread or jelly

Certain pills may require crushing to facilitate absorption

Powder is usually dissolved in water before giving

Always follow a pill or powder with a drink of water, unless there is some reason for not doing so

Do not give pills or powders to a delirious patient or to a small child

Never break a tablet If only half a tablet is ordered, dissolve the tablet in a small amount of water and give half of the solution Drugs with an unpleasant taste are often put up in a small gelatine container called a capsule These are given in the same manner that pills are given

Never give pills, capsules, or powders which have been spilled accidentally from their containers

**To give medicine by rectum.** Medicine is given by rectum when a direct local effect is required, when the patient is unable to retain medicine by mouth, and sometimes when the taste of the drug is very disagreeable. Absorption by rectum is much slower than by mouth and usually takes from one to two hours.

The drug is introduced into the rectum in the form of an enema or suppository. A suppository is a cone-shaped preparation of cocoa butter containing the drug, which is released when the cocoa butter melts in the rectum at body temperature. The suppository should be lubricated with petroleum jelly and carried wrapped in a piece of gauze to the bedside. The patient lies on his left side. A glove or cot is worn while inserting the suppository. If the patient is an adult, the suppository is pushed up as far as the index finger will reach. Pressure is made on the anus with a folded towel until the desire to expel the suppository has passed. Suppositories should be kept in a cool place to avoid melting. Narcotic suppositories must be recorded in the narcotic record book. Giving medication by enema is described in Chapter 32, "Elimination of Body Wastes."

**To give medicine by inhalation.** Inhalation is the drawing in of gas or vapor to the respiratory tract. Inhalations are effective almost immediately because of the rich supply of blood vessels in the lungs and their large surface area. Certain gases such as oxygen and ammonia, and volatile drugs such as amyl nitrite, benzoin, and ether are given by inhalation. A volatile drug is one which evaporates (passes into vapor) at ordinary temperature.

Amyl nitrite is frequently ordered for certain heart and asthmatic conditions. When inhaled, it relaxes the coronary arteries or, in cases of asthma, relaxes the spasm of the muscles of the bronchial tubes. Amyl nitrite is usually put up in small glass capsules, which should be quickly broken in a soft piece of cloth and held to the patient's nose for a few minutes. The effect upon the blood vessels is almost immediate. If too much is inhaled, the patient has a severe headache. Care must be taken that no tiny bits of glass enter the nose or mouth.

Oxygen therapy. Although oxygen and its importance in respiration was discovered by Antoine Lavoisier over two hundred years ago, the therapeutic use of oxygen is a fairly recent development in medical science.

Oxygen is essential for life. Since it cannot be stored in the body,

FIG 42 Administration of oxygen Oronasal mask with concentration meter (Courtesy of Oxygen Equipment Manufacturing Corporation, Norwalk Conn )

it must be continuously supplied to the blood by the respiratory system If for any reason there is a deficiency of oxygen, the respiratory system will try to compensate by increasing the rate of respiration Thus a patient is said to be short of breath when he has rapid, shallow respirations

Oxygen comprises 20 per cent of air and under normal conditions this amount is sufficient to meet the body needs In illness,

however, the body may be unable either to take in enough oxygen or to utilize it properly. This inability to utilize oxygen is called *cyanosis*. It causes a blue discoloration of the skin, which is easily detected in the lips, nail beds, and lobes of the ears. It then becomes necessary for the patient to inhale oxygen in concentrated amounts of 40 to 50 per cent.

The methods of introducing oxygen are by placing a tent over the patient, by placing a mask over the face, or by inserting a catheter through the nose. To these various appliances are attached tanks of oxygen, which are suitable in size and concentration. The choice of method depends upon the patient's condition, the facilities available, and the preference of the doctor.

In some schools of practical nursing, oxygen therapy is included in the curriculum, but as this is not yet nationally accepted, the procedures are omitted in this text.*

A practical nurse in the hospital would probably assist in the care of patients receiving oxygen therapy. In the home she may have to keep the patient supplied with oxygen. In either instance the most important thing to do is to follow instructions carefully and to observe the patient for respiratory distress or cyanosis. A calm attitude on the part of the nurse is most helpful to patients receiving this therapy. When working with a patient who has received oxygen therapy, the nurse will prevent any possible fire or explosion by taking the following precautions:

1. Do not allow oil to come in contact with the regulator. (The nurse should always wash and dry her hands carefully before handling this device.)
2. Do not use electrical devices, including heating pads, electric blankets, and electric call bells. Substitute a hand call bell for the electric one.
3. Do not allow smoking by the patient, visitors, or by other persons caring for the patient.
4. Place warning signs banning the use of the above-mentioned items in clear view of all.

Some physicians order oxygen therapy for patients in their own homes. In most cities all of the equipment or apparatus required can

* Harmer, Bertha, and Henderson, Virginia: *Textbook of the Principles and Practice of Nursing*, 5th ed. The Macmillan Company, New York, 1955. Chap 27, "Administration of Oxygen and Other Gases, and the Use of Respirators," pp. 766–802.

be rented from organizations supplying oxygen These companies furnish complete service, and are on call 24 hours a day They send trained technicians to install the equipment and give specific directions according to the orders of the physician

To give steam inhalations. The method is described in Chapter 34, "Applications of Heat and Cold"

To give dry inhalations Inhalations of stramonium and belladonna are sometimes ordered for the treatment of asthma The dry leaves of stramonium and belladonna, when ignited, smolder like incense and give off a smoky vapor

*Procedure* Make a cardboard cone wide at the bottom and tapering to a small opening at the top

Place leaves in a bowl, set on fire

Place the bowl on a tray or platter

Cover the bowl with the cone, the wide end resting on the platter

Carry tray to bedside and have patient lean over the cone to inhale the smoke through the small opening

Stramonium and belladonna can be bought in cigarette form The patient should inhale as much as possible while smoking to get the most benefit of the drug

To give medicine by inunction. Inunction is rubbing an oily or fatty substance into the skin Cocoa butter, cod liver oil, or olive oil is sometimes given by inunction to delicate babies or very emaciated patients A warm bath should be given first to stimulate the circulation and make the skin active The skin must be thoroughly dried and the substance warmed and well rubbed in with the palm of the hand When mercurial ointment is used for local effect, a glove should be worn to avoid becoming poisoned by this dangerous drug

Gargles. A gargle is a solution used to relieve inflamed conditions of the throat

Gargles generally contain menthol, sodium bicarbonate, glycerin, or sodium chloride

To prevent swallowing the solution, the patient should be instructed to exhale continuously while he is gargling

Sprays Sprays are solutions of drugs such as menthol, eucalyptol, or ephedrine in an oily or aqueous base They are employed to relieve congestion in the tissues of the nose or throat

The solution is sprayed on the mucous membrane by means of a hand atomizer. The delicate nasal tissues will be injured if much force is applied. As there is danger that the drug will irritate the mucous membrane, many physicians do not approve of nasal sprays.

Subcutaneous injection. Subcutaneous or hypodermic medication is the giving of drugs by injecting them under the skin with a needle and syringe.

Medication is given subcutaneously when: (1) rapid action is desired, (2) the patient is unable to take medicine by mouth, and (3) when the medicine would be changed by the digestive juices.

The drug is put up in ampoules, in vials, or in tablet form. A tablet is a concentrated form of the drug and must be dissolved in normal saline solution, distilled water, or boiled tap water. The tablet must be put up in the exact dosage ordered.

As it is important to guard against infecting the patient, the solution, needle, and syringe must be sterile. The skin over the site of the injection must be cleansed with an antiseptic.

The outer muscular part of the upper arms and thighs are usually chosen for the hypodermic injection. Large blood vessels and bony prominences must be avoided. When the medication is given at regular intervals, care must be taken to make the injection in a different spot each time and to use the arms and thighs alternately.

Glass syringes in different sizes are used to give the medicine subcutaneously and intramuscularly according to the amount of the drug ordered.

In some hospitals most of the equipment is autoclaved, or the syringe, needles, and spoon are boiled. A tray is always set up with the equipment ready for immediate use.

The following procedure is for use in the home.

*Equipment*

| | |
|---|---|
| 1 tray | Drug ordered |
| 2-cc Luer syringe | Tablespoon |
| Needles, ¾ or ⅝ in. long, gauge 25 | Strainer |
| Alcohol, 70 per cent | Saucepan |
| Sterile sponges or cotton balls | |

*Procedure.* Place alcohol and container of sterile sponges or cotton balls on the tray. Remove wire from the needle.

Place the plunger and barrel of syringe (separated) with the needle and spoon in the strainer Place the strainer in the saucepan and cover articles with water

Boil 5 minutes by the clock

Lift the strainer with one hand and, with the other, pour all the water out of the pan Replace the strainer in pan to cool

Fill spoon with water, hold over gas flame, and boil 1 minute

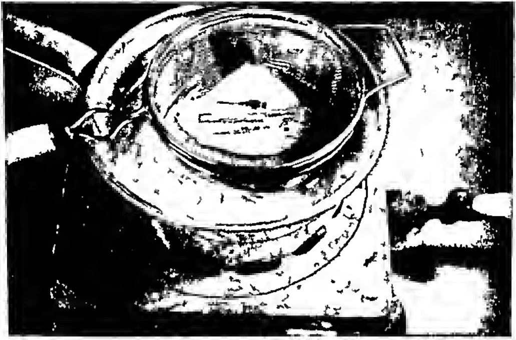

FIG 43 Sterilization of syringe and needle The syringe is taken apart and put on a gauze square in a strainer with the needle Then the strainer is placed in a pan of water so that the syringe and needle are covered by the water The water is boiled for five minutes (Courtesy of Medichrome-Clay Adams, New York, and Dr Henry Dolger and the New York Diabetes Association )

Assemble the syringe, being careful to touch only the knob of plunger and the outside of the barrel

Draw 1 cc of the boiled water into the syringe and discard the remainder

Drop the tablet into spoon (Avoid touching tablet with hands )

Expel water from syringe over the tablet Crush tablet with the tip of the syringe if necessary Draw solution up into the syringe

Touching only the hub of the needle, fit it firmly to the tip of syringe Be careful not to touch the long part or tip of the needle

Hold the syringe with the needle pointing upward, and gently expel any air bubbles.

Place the syringe on tray, resting the needle on sterile sponge. Carry to bedside.

*To give the injection.* Explain what you are going to do to the patient.

Choose the site for the injection. Dip the sponge in alcohol and cleanse the skin thoroughly, rubbing with a circular motion until the skin is pink.

Grasp the skin firmly between the thumb and forefinger of the left hand and take up a cushion of flesh.

Holding the syringe at an angle of 45 degrees to the skin, with the beveled edge of the needle upward, insert the needle quickly. (When the beveled edge is upward, the puncture is less painful.)

Draw plunger back slightly; if no blood enters the syringe, inject the solution by pressing the thumb slowly and steadily on the plunger. *Release the pressure of the skin while injecting the solution.* (If blood enters the syringe, withdraw the needle and make a fresh insertion with another sterilized needle.)

Before removing needle, place alcohol sponge at the point of insertion, withdraw the needle quickly, exerting pressure with the sponge; then massage the area gently to aid absorption into the tissues.

Place the patient in a comfortable position, and remove the equipment. Record the medication, the amount, the time given. Write *sc,* (subcutaneously) or *H* (hypodermically), to indicate the method of administration.

It is necessary to watch and record any reactions following the administration of the drug.

*Aftercare of syringe and needle.* Rinse the syringe with water, draw alcohol up into syringe and force it through the needle. Force air through the needle several times to make sure it is dry. The needle will clog if not cared for properly. Always replace wire in needle after use. Separate the plunger from the barrel of syringe; wash in soapy water, rinse, and dry thoroughly. Any particles clinging to the inner surface of the barrel should be removed with a cotton swab. Always separate the plunger and barrel before putting them back in the box. Keep in a safe place to avoid breaking.

Remember that the syringe is fragile and expensive to replace

When the syringe is put away assembled, the plunger is likely to stick so firmly to the barrel that it cannot be removed and is therefore useless The delay in getting a replacement in an emergency would be serious

*To withdraw drugs from ampoules* Certain drugs for hypodermic injections are put up in small glass containers called ampoules, which have no opening but taper at one end to a point A small file comes with the ampoule for use in opening Sometimes the groove is already made

Prepare the syringe and needle as previously described and place on tray with needle resting on sterile sponge

Shake ampoule until the narrow end or neck is free from the solution

To open, file the neck of ampoule, drawing the file back and forth on one side to scratch a slight groove (This ensures making an even break )

Holding ampoule with sponge, place another sponge over the tip to protect the fingers, and break away from the groove Discard sponge with glass fragments Still holding the ampoule, insert the needle into the ampoule, tipping the ampoule slightly, and draw the solution into the syringe Then proceed as in any subcutaneous injection

**To give insulin subcutaneously.** Insulin is sold in small bottles (vials) with sealed rubber tops Five types are available in pharmacies (1) "regular" insulin, which is water-clear, acts rapidly, and has an effect for only five or six hours, (2) crystalline insulin (solution of zinc insulin crystals), which is water clear and acts almost exactly the same as regular insulin, (3) protamine zinc insulin, which is turbid (cloudy), acts slowly, and lasts well over 24 hours after injection, (4) NPH (Neutral Protamine Hagerdorn) insulin, closely related to protamine zinc insulin, which is turbid, acts slowly, and lasts for 18 to 24 hours, (5) globin zinc insulin, which has a duration of action from 16 to 24 hours

Insulin is prepared in two strengths known as U40 (single strength) and U80 (double strength). U40 means that there are 40, and U80 that there are 80, units in each cubic centimeter Insulin is given with a special syringe marked off in units

*Equipment*

Insulin syringe with a U40 or U80 scale, depending on the strength of insulin to be used

Needles, preferably ⅝ or ¾ in. long and 25 gauge

Sponges

Alcohol

Plate

Saucepan and strainer

Insulin of required type and strength

*Procedure.* Boil syringe and needles for 5 minutes and assemble as directed in procedure for subcutaneous injection. A small plate, top surface facing downward, placed over articles in strainer, can be used as a sterile surface for syringe and sponges.

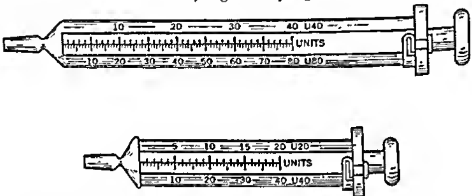


FIG. 44A. Insulin syringes, large and small size, each with two scales used in measuring insulin. (Harmer, Bertha, and Henderson, Virginia: *Textbook of the Principles and Practice of Nursing*, 4th ed. The Macmillan Company, New York, 1939.)

Wash hands thoroughly in soap and water. Place two sponges on plate. Wipe top of insulin bottle thoroughly with a sponge dipped in alcohol, being careful not to contaminate the rubber top after it has been cleansed. After attaching the needle to the syringe, draw out the plunger so that the syringe contains a little more air than the amount of insulin ordered.

If protamine zinc or NPH insulin is being used, carefully but gently roll the bottle so that the contents of the vial are thoroughly mixed without the formation of bubbles.

Push the needle carefully but firmly through the inner central portion of the rubber cap until the point of the needle is seen. Invert the bottle, force the air from the syringe into the bottle, and then

withdraw the desired amount of insulin By holding the syringe and needle point upward, air is easily expelled from the syringe before withdrawing it from the bottle Place the syringe on the plate and carry to the bedside

*To inject* Choose places where the skin is loose, preferably in the arms, thighs, or abdominal wall, and change the place of injection each time Cleanse the skin with the sponge dipped in alcohol and proceed as in any hypodermic injection

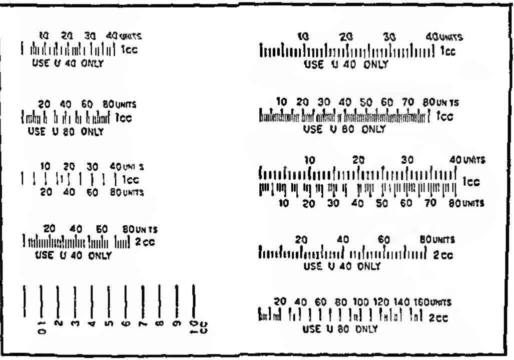


FIG 44B Scales for measuring insulin (Courtesy Becton, Dickinson & Company, Rutherford, N J )

Some patients require daily, before breakfast, both the clear (regular or crystalline) insulin and protamine zinc or NPH insulin Unless otherwise ordered these should be given by separate injection, the clear insulin being administered first The same syringe may be used for the second injection without reboiling, but another sterilized needle must be used Some physicians may order two types of insulin mixed in the syringe and given in one injection, if so, the regular (or crystalline) insulin should be drawn into the syringe first and then the NPH or protamine zinc type The nurse should under no circumstances mix insulins in the syringe except on specific orders

*Aftercare of the syringe*

1. Rinse syringe and needle immediately with cold water.
2. Dry syringe and blow air through needle repeatedly with syringe.
3. Keep wire in needle as usual.

In the home it is safer to boil the syringe and needles for 5 minutes each time they are used. However, if only one patient is concerned and he has his own equipment, this may be sterilized once weekly by boiling and kept the rest of the time in a covered dish under 70 per cent alcohol. If this is done, the alcohol should be discarded weekly and all equipment, including the dish and cover, boiled before replacing fresh alcohol.

Intramuscular injection. In some localities and under some conditions the practical nurse may be called upon to give certain drugs by intramuscular injection. Therefore she should have instruction and practice in this procedure, and should be aware of the important factors involved in this method of administration.

Medicine is given by intramuscular injection: (1) when rapid absorption of the drug is desired for obtaining a more immediate effect, (2) when the drug to be administered is too irritating to the tissues to be given by other routes, and (3) when the amount of the drug to be injected is too great to be given subcutaneously.

Because of its thickness, the gluteus maximus muscle in the buttock is usually preferred to the muscles in either the arm or the thigh. The buttock is divided into fourths with two imaginary intersecting lines. The needle should be inserted into the middle of the upper, outer quadrant. This is the safest place to avoid striking the sciatic nerve or entering the blood vessels. It is also very important to avoid striking a bone. If successive injections are to be given, the alternate buttock should be used.

The equipment needed is the same as used for giving a subcutaneous injection. A 2-, 5-, or 10-cc syringe may be necessary, according to the amount of medicine to be given. The gauge and the length of the needle vary with the type of drug ordered and the condition of the patient's tissues. The gauge of the needles commonly used is No. 20, 21, or 22, and the length 1½ to 2 inches.

The needle should be long enough to penetrate the muscle tissues, for if the medicine reaches the subcutaneous tissues only, and is not absorbed, it is very likely to cause considerable irritation.

To ensure the patient's complete cooperation, the nurse should explain the procedure to him before preparing the equipment. The sterilization of the equipment and the preparation of the drug are the same as for subcutaneous injections.

The patient should be completely relaxed, lying on his abdomen, with one pillow under his head, and his toes pointing inward to relax the muscle of the buttock.

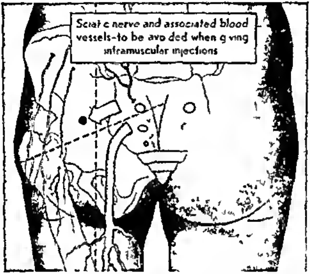


FIG 45 Site of intramuscular injection Large black dot (arrowed) indicates site for intramuscular injection (Courtesy of Becton, Dickinson & Company, Rutherford, N J )

With an alcohol sponge, vigorously scrub the area with a circular motion from the center of the chosen site to a distance of about three inches in diameter. Invert the needle and syringe and expel the air. Check the drug and amount to be given. Stretch the skin firmly over the site; hold the syringe perpendicular to the surface of the skin and insert the needle straight in the muscle, with a rapid, steady motion. Release the pressure on the skin. Draw back the plunger slightly to test whether or not a blood vessel has been entered. If blood appears in the syringe, withdraw the needle, replace with a new needle, and scrub the site again. If no blood appears, inject the drug slowly and steadily. Withdraw the needle quickly and massage the area gently with the alcohol sponge to hasten the absorption of the drug.

## ABBREVIATIONS *

| | |
|---|---|
| aa or $\bar{aa}$ | (equal parts) of each |
| a.c. | before meals |
| ad | to, up to, at |
| ad lib. | as much as desired; freely |
| alt. hor. | every other hour |
| aq. | water |
| aq. dist. | distilled water |
| b.i.d. | twice daily |
| b t. | bedtime |
| $\bar{c}$ | with |
| dil. | dilute |
| dr. | dram |
| gm. | gram; grams |
| gr. | grain; grains |
| gtt. | a drop; drops |
| H | by hypodermic |
| h † | hour |
| i.a. | if awake |
| i.m. | intramuscularly |
| noct. | in the night |
| non rep. | do not repeat |
| o d. or q d. | every day |
| o.h. or q.h. | every hour |
| o.m. or q. a m. | every morning |
| o n. or q.n. | every night |
| p.c. | after meals |
| p.o. | by mouth |
| p.r.n. | when required |
| pulv. | powder |
| q 2 h. | every two hours |
| q.i.d. | four times a day |
| q.s. | a sufficient quantity |
| $\bar{s}$ | without |
| s.c. | subcutaneously |
| sol. | solution |
| s.o.s. | one dose if necessary |
| ss or $\bar{ss}$ | one-half |
| stat. | at once |
| t.i.d. | three times a day |
| U. | unit |
| ung. | ointment |

* Goostray, Stella: *Problems in Solutions and Dosage,* 2nd ed The Macmillan Company, New York, 1952, p. 189.

† The symbol o is also used.

## IMPORTANT POINTS TO REMEMBER IN GIVING MEDICINE

No duty of a nurse should be more accurately performed than the giving of medicine. A mistake or miscalculation may have serious and sometimes fatal results. Accuracy, punctuality, and concentration are absolutely necessary.

In general, be sure that you have the right medicine, the right patient, the right dose, the right time, and the right method of administration. Read orders carefully. The following hints will be of value to you:

1. Always look at the label on medicine bottles three times before giving.
2. Consult the head nurse or physician when in doubt; you will never be criticized for being overcautious
3. Address the patient by name and wait for his response. All medication for unresponsive patients must be double-checked.
4. After preparing any medicine, give it to the patient yourself; do not leave the bedside until it has been swallowed.
5. If the patient refuses medicine, report the fact at once.
6. Never leave medicine within reach of the patient.
7. Know why a medicine is given; when giving a drug with which you are not familiar, find out the effects of overdosage. Repeated doses of certain medicines give rise to certain symptoms which you should recognize.
8. Medicine ordered for a certain hour must be given promptly—not five or ten minutes before or after the time specified.
9. Be certain that you are giving medicine by the route of administration ordered by the physician.
10. Before giving any medicine ordered for sleeplessness or restlessness, shield the patient from light, noise, and drafts and attend to all treatments, such as bedpans, drinks, dressings, and extra blankets.
11. Make medicine as agreeable to take as possible.
12. Sometimes a piece of ice may be given a patient to hold in his mouth before taking a dose of disagreeable medicine. The effect of the ice is to paralyze the taste nerves temporarily.
13. Whenever possible, avoid giving more than one medicine to the patient at the same time.
14. Record medicines or treatments immediately after they have been given—never beforehand.

15. Report any error at once.

16. A dose should never be forgotten, but if this happens, do not give the medicine until the next dose is due. Report such omissions to the head nurse or physician at once.

17. Do not wake the patient for medication unless you are ordered to do so.

18. In the home, when the doctor orders medication, be sure you understand exactly the time, the dosage, and the reaction.

When giving digitalis or morphine. When giving digitalis, a heart stimulant, *the patient's pulse must always be counted before giving medicine.* If pulse is 60 or below, do not give without reporting to head nurse or physician.

When giving morphine, which acts on the respiratory system and makes the breathing slower and more shallow, *always count the respiration before giving and report if it is below 14.*

To give castor oil. The taste of castor oil is almost impossible to disguise, but several ways of giving it make it easier to take.

Rinse inside of glass with lemon juice, then pour in required amount of oil and remainder of juice. Beat with spoon or small egg beater until the oil is held in suspension in the lemon juice. Follow with drink of orange juice, to remove taste of oil.

Add the required amount of oil to the juice of an orange or lemon. Then add a half teaspoonful of sodium bicarbonate and mix thoroughly. This makes a slightly effervescent drink and disguises the taste of the oil.

Mix strong coffee, cream, and castor oil in a glass. Stand glass in pan of hot water and beat thoroughly.

To give effervescent medicine. Effervescent medicine should be swallowed while it is effervescing. For this reason mix at bedside. When giving Seidlitz powders, use two glasses. Dissolve the powder in the blue paper (Rochelle salts) in two inches of water in one glass. Dissolve the powder in the white paper (tartaric acid) in one inch of water in the other glass and add to the salts. Do not try to make the patient take the whole powder at the same time; pour tartaric acid on a little at a time.

To give acids and iron. Give acids and medicines containing iron through a glass tube or straw, because acids injure the enamel of the teeth and iron discolors them.

**Points to remember in the home**

1 In the home the medicines should be kept on a tray in an inconspicuous place Children should never have access to medicines Medicines for external use should not be kept on the same shelf as medicines for internal use

2 Poisons should be clearly marked *poison* The bottles should be distinctive in shape or color or made of rough glass They should be kept separately from medicines Some medicines are beneficial as prescribed, but are poisonous if an overdose is taken

3 Many medicines deteriorate when kept on hand for some time and are unfit for use It is better to buy medicine in small amounts and throw away what is left when you are through with the medicine

4 Drugs dissolved in alcohol, such as iodine, become stronger when kept, as the alcohol used for dilution evaporates

5 Never take the responsibility for prescribing even the mildest drug

6 Medical supplies should be checked daily so that prescriptions can be reordered before the supply is exhausted

## *SUMMARY*

A drug is any substance used in the diagnosis, relief, cure, or prevention of disease It may be animal, vegetable, or mineral, but as soon as its composition has been determined it may be manufactured synthetically Drugs are prepared in one of three forms liquid, solid, or semisolid

Drugs are classified as official or nonofficial in the *United States Pharmacopoeia,* depending on the opinion of the American Medical Association Narcotics are controlled by the Federal Narcotic Law, and poisons can be sold by pharmacists with certain restrictions

The doctor prescribes medicine, the nurse follows the doctor's orders conscientiously and precisely

Medicines are administered in several ways by mouth, by rectum, by inhalation, by inunction, subcutaneously, intravenously, and intramuscularly If oxygen is ordered for the patient in his home, the equipment and apparatus may be rented in most cities

The nurse should be sure that she has the right medicine for the right patient, in the right dosage, at the right time, and to be given by the right route Children should be prevented from having access to medicines, poisons should be especially guarded

## Questions

1. What is another name for a drug?
2. Give two examples of drugs which are (a) liquids, (b) solids, and (c) semisolids.
3. Why should self-medication be discouraged?
4. What units are used (a) in apothecaries' weights? (b) In apothecaries' fluid measures?
5. In what system are centimeter, liter, and gram the units?
6. Discuss the method of ordering medicine in the hospital.
7. What governs the length of time necessary for the absorption of medicine?
8. If only half a tablet is ordered, what is the proper way of preparing the dose?
9. What is a *suppository* and *how* is it administered?
10. How are volatile drugs commonly administered? Name one such drug.
11. Define (a) a gargle, (b) a spray.
12. Define an inunction. What precautions should be taken if the medication contains mercury and is used to produce a local effect?
13. Under what three conditions is a medication given subcutaneously?
14. In a subcutaneous injection how is the needle held to make the puncture less painful?
15. Describe the aftercare of the syringe and the needle.
16. Under what conditions is medicine given by intramuscular injection?
17. Where should the needle be inserted? Why is the exact location so important? Why should the needle be long enough to penetrate the muscular tissue?
18. Why is the needle inverted before being inserted?
19. Why is the plunger drawn back slightly before the drug is injected?
20. How is an ampoule opened?
21. How can you be sure you are giving medication to the right patient?
22. How can the taste of unpleasant powders be disguised?
23. How should Seidlitz powders be prepared so that they may be given to the patient while they are still effervescent?
24. How are medicines containing iron and acid administered?

# 36

# SOME DRUGS AS THEY AFFECT THE BODY SYSTEMS

## *THE EFFECTS OF DRUGS*

Drugs are prepared in various strengths and in many forms, and they are prescribed in different doses However, the effect of a drug may not always be that which is expected Some reactions to drugs may be unusual, others, the opposite of what is expected, and some doses, even when large, may produce no effect at all After every administration the nurse should carefully record both the dose and its effect on the patient

Some effects of drugs are local, others are general, or systemic Local action of a drug may affect the function of a particular organ, but general effects are obtained only when the drug circulates in the blood stream or in the body fluids

When the drug enters the blood stream, it is said to be absorbed, and when it leaves the blood stream, it is said to be excreted Some drugs are absorbed faster than they are excreted Part of the drug, remaining in the body, piles up, after prolonged administration, producing cumulative or poisonous effects

Classification of drugs according to the system which they chiefly affect makes it easier to learn something about them and the re-

actions which they cause. From a brief list, such as given in this chapter, the practical nurse may gradually increase her knowledge as she grows in experience, so that she may understand the reasons why the physician orders a certain drug for an individual patient.

## *DRUGS AFFECTING THE NERVOUS SYSTEM*

The central nervous system consists of the brain and spinal cord, with many thousands of nerve fibers.

The principal drugs used are either stimulants or depressants.

### STIMULANTS

Caffeine, which occurs chiefly in coffee, is considered the ideal stimulant.

### DEPRESSANTS

Opiates. The opiates are made from opium, found in the juice of the white poppy, an Asiatic plant. *Morphine*, an alkaloid, is one of the most important opiates. Its principal effects are to relieve pain primarily, and also to induce sleep, lessen worry, slow breathing, induce perspiration, and check peristalsis.

The symptoms of overdosing of morphine or its derivatives are mental excitement, followed by very slow respiration, pin-point pupils, weak pulse, and finally coma from which the patient cannot be aroused. (Fourteen or fewer respirations a minute is a danger signal.)

The continued use of morphine causes loss of appetite, constipation, tremor, loss of weight, and loss of will power. Old people and children are likely to get poison symptoms from very small doses of morphine.

*Codeine,* also an opiate, produces a lighter sleep than morphine and is used principally to check coughing and to lessen pain. It should be used in moderate amounts. It is less habit-forming than morphine.

*Dilaudid,* prepared from morphine, relieves pain quickly and slows respiration. It usually causes less nausea, vomiting, constipation, and drowsiness than morphine.

*Pantopon* does not depress the respiration or check peristalsis, and is frequently used in the care of the aged.

Demerol is a trade name of a chemical compound, and although not an opiate it is related chemically to atropine and morphine, and has effects similar to morphine, but is milder and somewhat less habit-forming.

## SALICYLATES

Acetylsalicylic acid, or aspirin, is manufactured from coal tar. It is used chiefly to relieve nervousness, headache, or other pain. It is widely used for rheumatic conditions. Symptoms of overdose are: ringing in the ears, nausea, and profuse perspiration.

Sodium salicylate and other salicylates relieve pain in the joints, and neuralgia.

## SEDATIVES

Sedatives are used to relieve nervous tension. Hypnotics are drugs which induce sleep. They are also mildly analgesic.

It should always be remembered that before any narcotic or hypnotic is given, every effort must be made to induce sleep by natural means, such as rubbing with a rhythmic motion, giving a warm drink, a glass of sherry if ordered, or sometimes a light meal, to bring the blood away from the brain to the stomach. Before any of these measures are taken, the room should be darkened and properly ventilated, and all disturbing noises should be eliminated.

Sedatives and hypnotics lessen the activity of the body, hence reduce nervousness and excitement and induce sleep. Although they are used whenever actually needed, the good nurse will try to keep her patient in condition without the use of sedatives. She can rub his back, smooth his pillows and covers, draw the shades, and thus produce a quiet atmosphere which creates the impression that the time has come to sleep.

Barbiturates are preparations of barbital, an artificial chemical substance in the form of a white crystaline powder, which has a bitter taste. The barbiturates lessen nervous irritability, and, because of their quieting effect, indirectly lower blood pressure. The symptoms of an overdose are slow pulse and shallow breathing. Their

continued use may form a habit which lowers efficiency, causes a loss of memory, and fosters delusions of neglect and persecution.

Among the common barbiturates are pentobarbital (Nembutal), phenobarbital (Luminal), and Seconal, all of which have some special uses.

PENTOBARBITAL (Nembutal) is used as a sedative before an anesthetic is given. It is the most powerful of the barbiturates, and it has greater toxic effects. It is given by mouth or rectum. The symptoms of an overdose are heavy stupor, subnormal temperature, weak pulse, low blood pressure. The continued use of any of the barbiturates may be habit-forming and result in depression and many other disorders.

PHENOBARBITAL (Luminal) produces a deep sleep. It indirectly lowers blood pressure and reduces the symptoms of exophthalmic goiter. It is also used to treat epilepsy and St. Vitus' dance. Prolonged administration may cause skin rashes and other poisonous results.

SECONAL is a sedative and hypnotic of short duration which is used both to lessen nervousness and to produce sleep. It is often employed before an operation and during labor.

Bromides are crystalline salts, used principally to relieve nervous excitement. They are effective in neuralgia and are especially useful to quiet emotional and hysterical patients. The symptoms of overdosage are depression, loss of interest, stupor, slow respiration, digestive disturbances, and skin eruptions. Acute poisoning from bromides occurs very rarely. When the bromide is stopped, the symptoms gradually disappear.

Paraldehyde has an unpleasant burning taste and odor. It is used to produce a normal sleep, without aftereffects, lasting for several hours. It does not relieve pain, but does lessen muscular activity in epilepsy and delirium tremens. Its disagreeable taste and lingering odor on the breath, as well as the irritation of the throat and stomach, are the chief disadvantages of using it.

## ANTICONVULSANTS

Anticonvulsants are used to reduce muscular activity in such diseases as epilepsy.

Dilantin (Dilantin sodium) is an anticonvulsant. It is used instead of the bromides or phenobarbital in relieving epilepsy. Although it is powerful, it does not cause the extreme depression of phenobarbital. Often it is combined with phenobarbital, since the combination works better than either drug would alone. The toxic effects include nervousness, blurring of the vision, headache, and confusion.

Tridione (trimethadione) is used in the relief of epilepsy. It is used more successfully with children than with adults. Toxic reactions, including irritation in the stomach, nausea, skin rashes, and blurred vision, are not infrequent.

### ANESTHETICS

Anesthetic agents are usually classified as local and general. Novocain is the local anesthetic commonly used; ether, nitrous oxide, cyclopropane, and intravenous thiopental sodium are the best-known general anesthetics. General anesthetics are administered by inhalation, by intravenous injection, or rectal instillation; they result in unconsciousness. Local anesthesia results in a loss of sensation without loss of consciousness. Local anesthetic agents are injected near nerve roots or endings. Spinal anesthesia is performed by injecting the anesthetic fluid between the membranes covering the spinal column. The nerve roots of the spinal nerves are bathed in the anesthetic solution, with the result that all points below the point of injection are insensitive to pain, and all voluntary muscular reactions are prevented.

## *DRUGS AFFECTING THE BLOOD AND BLOOD-FORMING ORGANS*

The heart is subject to much disease; in fact, one of every six or seven deaths is caused by cardiac disorders. Since many heart disturbances result in a lessening of activity in the circulatory system, the first group of drugs considered are stimulants, which increase the action of the heart.

## STIMULANTS

Digitalis (new forms: Crystogien and Purodigen). Digitalis is obtained from the leaves of the purple foxglove, a plant which grows in temperate climates. It is a stimulant which acts on the heart muscle. It makes the pulse slower and stronger and improves the circulation. The symptoms of overdosage are a pulse below 60, or a sudden drop in pulse rate, either of which should be immediately reported to the physician. Nausea and vomiting and headache may also be symptoms of overdosing. If any of the above symptoms occur, and it is impossible to get in touch with the physician immediately, the digitalis must be stopped and the patient kept warm and quiet.

Many other preparations of digitalis of varying strength are given hypodermically or intravenously; among them are Digifolin, which comes in glass ampoules, and Digalen, which comes in tablet form.

## DEPRESSANTS

Depressants are drugs which diminish the action of the heart. An example of a heart depressant is *quinidine*, which is prepared from the bark of the cinchona tree, found principally in South America. Quinidine acts principally on the heart muscle and causes the heart beat to become slower and more regular. The symptoms of overdosing are nausea, vomiting, fainting, flushing of the face, dizziness, and headache. The drug should be stopped immediately if any of these symptoms occur, and the physician should be notified.

Vasodilator drugs. *The nitrites* are a group of drugs which are able to dilate the blood vessels. They are absorbed into the system through the mucous membrane of the mouth, rectum, or lungs. By dilating the blood vessels they lower the blood pressure because they reduce the amount of resistance which the blood has to meet as it passes through the circulatory system. Other uses for these drugs are to relax the contracted condition of the heart muscles in angina pectoris. They also increase the activity of the kidneys.

Amyl nitrite is a salt formed by combining nitrous acid with an alkali or with alcohol. It reduces blood pressure by relaxing the muscles of the bronchi and dilating the blood vessels. Amyl nitrite comes in small glass "pearls" which are broken in a piece of cloth

and applied to the patient's nose. The drug acts very quickly, the patient's face becomes flushed, and he often complains of a headache. The cloth should be withdrawn from the patient's nose as soon as he complains of these feelings. Symptoms of overdosing are very severe headache, sometimes accompanied by dizziness, and a feeling of faintness. These symptoms are relieved if the drug is stopped and the patient lies down.

NITROGLYCERIN is given by mouth usually in tablet form. The tablet is placed under the tongue. It has the same effect as amyl nitrite, but its action is slower and the effect is more lasting.

IRON is a heavy metal from which certain drugs are prepared. It is found in the hemoglobin of the blood as well as in many foods. It is used to increase the hemoglobin and the number of red cells, and locally as an astringent. The symptoms of overdosage are headache, nausea, vomiting, and constipation. Iron is frequently given in Blaud's pills, tincture of iron, elixir of iron, quinine, and strychnine. Iron is always given after meals. In liquid form, it should be given through a glass tube to avoid discoloring the teeth.

LIVER CONCENTRATE is derived from the organs of animals. It contains riboflavin, nicotinic acid, and choline in specified amounts. It is classed as one of the Vitamin B and G preparations.

LIVER EXTRACT, prepared from the liver of animals, is used to stimulate the formation of the red blood cells. It is used principally in anemia, which is caused by a deficiency in the red blood corpuscles. The diet in anemia is briefly discussed in Chapter 19, "Diet in Disease."

Anticoagulants are of great service in blood transfusions to prevent the coagulation of blood. They are also used in laboratory procedures.

HEPARIN AND EPIHEPARIN are obtained from extract of liver. These drugs are coming into wide use as drugs to prevent clots or thrombi from being formed or extended during surgical operations.

DICUMAROL (dicoumarin) is an anticoagulant, used to counteract the use of vitamin K by the liver, thus prolonging the time needed by the blood to coagulate. Forty-eight hours must pass after the administration of this drug before very much effect is noted. The effect lasts for about five days. This drug is often given with heparin, which takes effect immediately but loses its effect soon.

## *DRUGS AFFECTING THE GASTROINTESTINAL TRACT*

Antacids are used in the treatment of peptic ulcers, which are related to long periods of worry and nervousness. The gastrointestinal tract is irritated largely by an increase in the flow of hydrochloric acid. Antacids and a bland diet relieve this condition.

Sodium bicarbonate (baking soda) is a typical mild alkali. It is used to neutralize acids in the system and to check nausea, vomiting, and fermentation in the stomach. It is a component of most mouthwashes, gargles, and toothpastes because of its effectiveness in dissolving mucus. It is soothing and is used as a solution for burns and various skin conditions to dissolve crusts and secretions. It is not given to patients on a low-sodium diet.

Sippy powder is named for an American physician, Dr. Bertram Sippy. It is used to check the acidity of the gastric juices.

Amphojel and related compounds. Amphojel is a jellylike substance used to neutralize the acidity of the stomach. It is frequently prescribed in gastric ulcers.

Cathartics are drugs used to expel gas from the stomach and intestines and to move the bowels. Laxatives have a mild action while purgatives cause a more thorough evacuation.

Since some foods have a laxative action, they should be given before resorting to medication. Foods which have a high degree of cellulose—high-residue foods—are good bowel regulators.

Mineral oil is a laxative which may be purchased in bulk. It is made from petroleum, an oily liquid which comes from the earth.

Agarol is made from a combination of agar-agar, a seaweed, and mineral oil. It increases the bulk of the fecal masses and promotes peristalsis.

Milk of magnesia is a salt suspended in water, making a thick, milky fluid. This alkali is one of the saline purgatives; thus it will not be absorbed to any great extent into the system. It draws water from the system, thus relieving edema, and also acts as a purgative.

Seiolitz powders are effervescent. They are used as a purgative.

Magnesium sulfate is a white crystalline powder readily soluble in water. It has a disagreeable metallic taste. It increases the bulk of the intestinal contents by drawing water from the tissues

and by increasing peristaltic action The small amount which is absorbed will increase the flow of urine

Irritants ALOPHEN is the trade name of a laxative pill made from a combination of plants and phenolphthalein

CASCARA is obtained from the bark of a shrub It is prepared in both liquid and pill form Since it is bitter, an aromatic preparation is generally prescribed to accompany it Its effect is almost entirely on the large intestine It may be given at any time, but since it requires several hours before acting, it is convenient to take it at night Although it produces its effect by irritation, it is not griping, and it does not lose its efficiency even after prolonged use It may gradually be withdrawn as the condition improves It is very often prescribed in chronic constipation

PHENOLPHTHALEIN, a chemical substance, is a good laxative, producing frequent soft stools with little griping

## *DRUGS AFFECTING THE RESPIRATORY SYSTEM*

Expectorants An expectorant is defined as a drug which aids in loosening the material from the lungs and trachea

AMMONIUM CHLORIDE, like the saline expectorants, has a salty flavor, is white, and is freely soluble in water It is soothing in bronchitis because it increases the secretion of the bronchi and loosens the cough in both acute and chronic conditions

IPECAC, in small doses, is an expectorant, made from a dried root In large doses it is an emetic

COUGH SIRUPS generally rely on *codeine* for their effectiveness Codeine is especially adapted to loosen the cough The sirup has a soothing effect on the mucous membrane

## *DRUGS AFFECTING THE ENDOCRINE SYSTEM*

Thyroxin is either obtained from the thyroid gland of animals or made synthetically The essential element is iodine, which is often administered in small doses in iodized salt or in the water supply in those regions where the soil is deficient in iodine

Thyroxin has three uses (1) to supply thyroid in thyroid

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Thyroxin has three uses: (1) to supply thyroid in thyroid

deficiency, (2) to increase the metabolic rate, even if the patient shows no other marked symptoms of hypothyroidism, and (3) to treat obesity.

It is recognized, however, that thyroxin encourages, rather than discourages, the obese person in his tendency to overeat. Excessive dosage is very dangerous, since it produces the symptoms of overactivity of the thyroid gland: nervousness, instability, trembling, and weakness, in addition to an abnormally high blood pressure.

Estrone (theelin) is a natural substance occurring in both animal and plant life. Theelin is a derivative of biologic substances. Although it is beneficial in menstrual irregularities of endocrine origin, it should not be given to women who may have inherited a sensitivity to cancer of the mammary or gonad glands.

Androgens are male hormones, one of which is testosterone. Androgens are useful in furthering the sex development in immature males, and in inducing the appearance of secondary sex characteristics, such as hair on the body. They also decrease the metabolism and the excretion of inorganic salts—phosphorous and potassium, as well as nitrogen.

## *DRUGS USED IN COMMUNICABLE DISEASES AND INFECTIONS*

Antibiotics. Certain drugs prepared in chemical laboratories destroy bacteria or check their growth. They are called antibiotics. This means that the drug is a substance, produced by organisms, which destroys or checks the growth of other organisms. Among these are penicillin, streptomycin, terramycin, and others.

Penicillin is made from a mold of the same family which is used in making Roquefort cheese. It has been found to destroy some disease-producing bacteria such as those causing syphilis and gonorrhea.

Streptomycin is produced from a variety of molds found in the soil. It is useful in some infections which are not controlled by penicillin, or the sulfonamides.

Terramycin is an antibiotic which may be given by mouth, since it is absorbed in the stomach. It is effective in pneumonia and possibly in other diseases caused by viruses.

Aureomycin (chlortetracycline hydrochloride) does not need to be administered as often as penicillin, for its action lasts longer It is probably the most important of these drugs developed since penicillin, although it is generally effective in most cases where penicillin also would be effective

Sulfonamides The sulfonamides, or sulfa drugs, are valuable in treating streptococcic, staphylococcic, gonococcic, and other infections, such as lobar pneumonia Since they are often toxic to the human system they should be used only under professional guidance

## *SUMMARY*

The effects of drugs are not always what might be expected, therefore, the patient should be carefully observed to note unusual or undesirable reactions Some effects of drugs are local and some are general The length of time required for the absorption and the excretion of a drug varies

The drugs mentioned in this chapter are grouped around nervous, circulatory, gastrointestinal, respiratory, endocrine, and communicable diseases

The majority of drugs are either stimulants or depressants

Caffeine is the chief stimulant of the nervous system

The depressants affecting the nervous system are the analgesics, which include the opiates and the salicylates The depressants include the sedatives, the anticonvulsants, and the anesthetics

The chief stimulant affecting the circulatory system *is* digitalis in its various preparations The depressants include quinidine and the vasodilators Iron, liver concentrate, and liver extract increase the hemoglobin and the number of red cells in the blood The anticoagulants are useful in delaying blood clotting

The drugs used for their effect on the gastrointestinal system are the antacids, the laxatives and cathartics, the salines, and the irritants

The principal drugs used for diseases of the respiratory system are the expectorants Codeine, an opiate, is used in cough medicines because it is especially adapted to loosen the cough

The endocrine system is benefited by the biologicals derived from the endocrine glands of animals, or made synthetically

Communicable diseases have been successfully treated with the antibiotics.

Antibiotic drugs are being developed constantly. The nurse will follow closely the doctor's orders and will report any unfavorable symptoms immediately, as it has been found that many persons are allergic to certain antibiotic drugs.

The sulfa drugs sometimes produce toxic effects; therefore, the nurse should observe carefully all symptoms that may indicate troublesome effects.

## Questions

1. When is a drug said to be absorbed? When excreted?
2. What is meant by a "cumulative" effect?
3. What is the primary purpose of prescribing opiates?
4. What are the symptoms of overdosage of morphine? What effects come from its overuse?
5. What are sedatives used for? What are hypnotics used for?
6. What can the nurse do to help her patient sleep naturally, so that a sedative will not have to be given?
7. What is the effect of the habitual use of barbiturates?
8. What drugs are used to quiet hysterical patients?
9. What drug has an effect similar to that of amyl nitrite but is slower in taking effect and more lasting in effect?
10. What great service is performed by the anticoagulants?
11. What drugs are generally used to relieve peptic ulcers?
12. What kinds of foods should be eaten before resorting to cathartics and laxatives?
13. How does Agarol prevent constipation?
14. How does magnesium sulfate increase the bulk of the intestinal contents?
15. Why is cascara often prescribed for chronic constipation?
16. What is the difference in the effect of a small and a large dose of ipecac?
17. Discuss the symptoms of overdosage of thyroxin.
18. Discuss the effects of the antibiotics.
19. When is streptomycin most useful?
20. What is the most valuable of the sulfa drugs?

# 37

# EMERGENCIES

An emergency is a condition requiring immediate action The treatment given before the patient is removed from the scene of the accident is called *first aid* Some knowledge of first aid makes it possible to help the injured person while waiting for the physician's arrival It is much better to do nothing than to do the wrong thing, but, even without special knowledge of how to treat the injury, certain definite rules should be followed

1 Send for a physician
2 Keep calm and send away everyone who is not needed
3 Do not move the injured person if it can be avoided
4 Try to keep him warm and quiet

Accidents are usually followed by what is known as *shock* This is a condition of collapse in which vital functions are affected It may be slight or severe This condition is sometimes more serious than the injury itself and requires prompt treatment In extreme cases, transfusion of blood and saline solutions may be necessary A severe shock may result in death

The symptoms of shock are usually extreme pallor, cold extremities, perspiration on the face The pulse is likely to be weak All that needs to be done before the arrival of a physician is to keep the victim lying flat and cover him with blankets or whatever is at hand

He should be taken to a quiet place as soon as possible, but sometimes great harm is done by moving and handling. If the patient cannot be moved immediately, be sure it is warm and dry underneath his body, even if only newspapers are available. If the patient is conscious, a hot drink of tea or coffee is indicated, not as stimulation but as an aid in increasing body warmth.

Asphyxia, or suffocation, occurs when for any reason oxygen is prevented from entering the lungs. Some causes of asphyxia are choking, drowning, and inhaling smoke or gases. such as carbon monoxide.

CHOKING. Small articles may enter the trachea by accident. When the article is lodged in the larynx, it is sometimes possible to remove the article with the fingers. Never push or poke at the obstruction. If the patient is a child, take him by the feet, shake him, and slap him on the back. An adult should be laid face down, with the head hanging lower than the body, and he should be slapped on the back. A doctor should be summoned immediately, as this accident may often be fatal.

DROWNING. In a drowning accident the mouth and throat become filled with water, which prevents the entrance of air to the lungs. First-aid treatment is artificial respiration, but, whatever method is used, the following preliminary measures should be observed:

1. Loosen the clothing.
2. Remove any mud or other obstruction from the nose and mouth.
3. Be sure that the tongue has not fallen back in the mouth.

*Back Pressure–Arm Lift Method of Artificial Respiration* *

1. *Position of the subject.* Place the subject in the face-down prone position. Bend his elbows and place his hands one upon the other. Turn his face to one side, placing his cheek upon his hands.

2. *Position of the operator.* Kneel on one knee at the subject's head, facing him. Place your knee beside the subject's face, close to his forearm. Place your opposite foot near his elbow. Place your hands upon the flat of the subject's back so that the heels of your hands lie just below a line extending between his armpits. With the tips of your thumbs just meeting, spread your fingers downward and outward.

* *Supplement #1 to The American Red Cross First Aid Textbook* (ARC 1086A) (9-53). The American Red Cross, Washington, D. C., September, 1953.

3 *Compression phase* Rock forward until your arms are nearly vertical, and allow the weight of the upper part of your body to exert a slow, steady, even pressure downward upon your hands, to force the air out of his lungs Your elbows should be kept straight and the pressure should be exerted almost directly downward on the subject's back

4 *Position for expansion phase* Release the pressure, avoiding a final thrust, and begin to rock backward slowly Place your hands upon the subject's arms just above his elbows

5 *Expansion phase* Draw his arms upward and toward you Apply just enough lift to feel resistance and tension at the subject's shoulders Do not bend your elbows As you rock backward, the subject's arms will be drawn toward you Then lower the arms to the ground This completes the full cycle The arm lift expands the chest by pulling on the chest muscles, arching the back, and relieving the weight on the chest

The cycle should be repeated 12 times a minute at a steady, uniform rate The compression and expansion phases should occupy about equal time, the release period being of minimum duration

*Additional related directions* It is all important that artificial respiration, when needed, be started quickly The body of the subject should be inclined slightly so that fluids will drain better from the respiratory passages The head of the subject should be extended, not flexed forward, and the chin should not sag lest obstruction of the respiratory passages occur A check should be made to ascertain that the tongue or foreign objects are not obstructing the passages These matters can be cared for when placing the subject into position or shortly thereafter, between cycles A smooth rhythm in performing artificial respiration is desirable, but split second timing is not essential Shock should receive adequate attention, and the subject should remain recumbent after resuscitation until seen by a physician or until recovery seems assured

Do not get discouraged Stick to the routine three or four hours if necessary, working in relays with others

Inhaling smoke or gases The back pressure–arm lift method of artificial respiration is also used in cases of gas poisoning (including poisoning from inhaling automobile gas fumes)

The first thing to do is to get the victim into fresh air to any room where there is no gas or, if warm enough, out of doors Then begin artificial respiration

Electric shock. Severe electric shocks are usually encountered only when the part of the body coming in contact with the charged

surface is wet. There is always the danger, however, of receiving an electric shock from the house current, so care should be taken to keep all electrical equipment in good repair. Under such conditions a person may be rescued without danger if the rescuer wraps his hands in rubber, such as a bath mat, or in a dry, heavy bath towel before he breaks the contact of the patient with the wire. This establishes a resistance to the current of electricity, which would otherwise pass through the rescuer. Of course, turn off the current if possible. Be sure not to touch the victim's body without protecting your hands. After the contact has been broken, it is often necessary to start artificial respiration, which should be continued for three or four hours before giving up. Again, it may be necessary to work in relays with others.

A burn is a tissue injury caused by heat, poisons, irritating substances, or x-ray. Burns are classified as being of the first, second, or third degree.

In a *first-degree burn,* the skin is reddened but not injured, as in a sunburn. The redness is caused by congestion of the small blood vessels near the surface of the skin.

In a *second-degree burn,* there is inflammation of the skin and blisters.

In a *third-degree burn,* the underlying tissue is destroyed and the skin actually charred. Shock and other symptoms are severe, according to the extent of the skin destroyed.

In either a second- or third-degree burn, the physician should be notified at once, and requested to direct immediate treatment. Meanwhile, the patient should be kept quiet and warm.

In all burns of any extent, no attempt should be made to remove the burned clothing, but the individual should be wrapped in clean sheets and blankets. He should be taken immediately to the nearest hospital emergency ward. The physician should be notified that the patient has been transferred or, more likely, he himself will order the patient to be sent there.

If the clothing is on fire when the victim is encountered, the flame may be smothered by wrapping the person in a rug, blanket, or other heavy material. If there is nothing of this sort at hand, make the person roll on the floor or ground.

If any sterile petroleum jelly is available, it may be applied to a painful, exposed burned surface. However, it is far better emer-

gency treatment to wrap the badly burned portion of the patient in a clean laundered towel or sheet and see that the patient is taken immediately to an emergency ward of a near-by hospital

In the case of first-degree burns and mild second degree burns, petroleum jelly or any other clean oily substance may be applied with considerable relief or comfort In applying a greasy substance to a burned area, it is well to remember that it is next to impossible to determine the extent of a burn for 24 to 48 hours from the time of the burn Therefore, the "normal" appearing skin bordering the burn should be covered with petroleum jelly, as well as the burned surface First- and second degree burns about the face may be covered with petroleum jelly without any further bandaging If a bandage is used elsewhere, it should be applied lightly until a physician has been called to see the burn, at which time a uniform type of pressure dressing may be applied

With extensive burns and third degree burns, it requires considerable time for the skin to re cover the entire surface In extensive burns, skin grafting is often necessary, but this, of course, is done by the physician, who keeps the patient under constant supervision

Bruise or ecchymosis A bruise is an injury to the subcutaneous tissue The skin is not usually broken but becomes discolored because of the escape of blood from the capillaries After cleaning the part with hot water and soap, apply ice cold compresses or an ice bag If possible, keep the part elevated

A wound is a break in the skin When it is caused by a fall or a blow from a blunt object such as a heavy stone, it is called a *contused wound* The surrounding tissues are usually discolored by hemorrhage under the skin When it is caused by a bullet or pointed object such as a nail, it is called a *puncture wound*

*Treatment* Sterile dressings should be applied to a wound, but, when a sterile dressing is not available, boil a piece of cloth, or, in an emergency, use the inside of a clean folded handkerchief When applying any dressing, be careful not to touch the part which comes against the cut The slightest carelessness in applying the dressing may infect the wound Absorbent cotton should not be used on a wound, as small particles will stick to the raw surface Do not wash the wound with water or with any antiseptic solution, as germs present on the surface may be carried into the wound and cause infection Do not apply salve or other grease to a fresh cut

Even if an emergency dressing is done, it is safer to take the patient to a doctor as soon as possible to have the wound properly cleansed and dressed, as serious infection may result from the smallest wound. In some cases the physician may decide that tetanus antitoxin should be given.

Hemorrhage from a wound. Hemorrhage is bleeding from any blood vessel and may be severe or slight, according to the extent or nature of the injury. Bleeding is usually checked by exposure to air and the pressure of the dressing. Severe bleeding is serious and requires prompt treatment. A physician should be called immediately.

When the blood spurts from a wound, it shows that an artery has been cut. Since the blood in an artery is flowing from the heart with great force, pressure must be applied above the wound. When the blood flows in a steady, continuous stream, it shows that a vein has been cut. Since the blood in a vein is flowing toward the heart, pressure must be applied below the wound.

From experience gained in World War II, The American Red Cross has modified its practice regarding the use of the tourniquet in first aid.* It warns "first aiders" against the indiscriminate use of the tourniquet. The tourniquet should be applied only when life is endangered by the cutting of a large artery, or from a severe wound or laceration.

Foreign bodies in the ears, nose, eyes. Children sometimes poke small articles up the nose or in the ears. If there is the slightest difficulty in removal, the patient should be taken to a physician or the hospital in order to avoid injury to the soft tissues. If the article is a bean or pea or anything which will absorb water, the nose or ear must not be irrigated.

A foreign body, such as a small particle of dust or a cinder, may be removed from the eye by using the corner of a clean handkerchief, a piece of gauze, or a swab. If the cinder or dust is embedded in the tissue, do not try to remove it but take the patient to an eye specialist or a hospital.

Poison ivy. It has been found helpful after exposure to poison ivy to wash the part with yellow laundry soap and follow with application of 70 per cent alcohol.

* *Supplement #1 to The American Red Cross First Aid Textbook* (ARC 1086A) (9-53). The American Red Cross, Washington, D. C., September, 1953

Insect bites

Bee or wasp bites Remove the stinger by exerting pressure on the surrounding area Then apply a coating of baking soda (sodium bicarbonate) moistened with water or a solution of ammonia water, as an alkali is needed to neutralize the acid left in the wound by the bee or wasp Frequent hot or cold applications of the alkaline solution should be applied until the pain has subsided Call a physician if the bites are numerous, as severe poisoning may result in collapse and possibly death

Mosquito bites are sometimes infected by constant scratching, therefore, if a child is much bothered by the itching, it is advisable to give him a soothing application which he may apply Witch hazel or a paste made of sodium bicarbonate and water is usually effective

Chigger bites The *chigger,* also called *jigger* or *red bug,* is a tiny red mite which burrows into the skin causing intense itching Chiggers are plentiful in the southern and midwestern states in spring and summer, they are particularly troublesome to children playing in the grass Scratching produces sores Witch hazel or a paste made of sodium bicarbonate and water usually relieves the itching, but if not, and sores develop, have the patient seen by a physician

A fracture is a break in a bone When this occurs, the first thing to do is to send for a physician The patient should not be moved before the physician's arrival If removal is unavoidable, the part must be kept still (immobilized) and the extremity supported on a pillow or protected boards Keep the patient warm to avoid shock

A convulsion is an involuntary contraction of the muscles commonly called a spasm or a fit Convulsions may be caused by [illegible] poisons, by infections of the brain, by epilepsy, or by injuries to the head

Since a convulsion may be the beginning of a severe [illegible] a physician should be summoned at once Until he arrives [illegible] patient from injuring himself without restricting his [illegible]

Poisoning In case of poisoning, the physician [illegible] once Find out the kind of poison taken If the [illegible] to tell, an empty box or bottle may be found to [illegible] swallowed Do not wait for the arrival of the [illegible] treatment immediately

1. Neutralize the effect of the poison by giving an antidote.
2. Give an emetic, except when severe burning has occurred.
3. Give something which is soothing to the digestive tract, such as egg white, starch water, or milk.
4. Treat symptoms of collapse or shock by the usual methods.

AN ANTIDOTE is an agent which counteracts the effect of a poison. The antidote for a strong acid is an alkali, such as baking soda, magnesia, or chalk. The antidote for a strong alkali is an acid, such as vinegar, diluted with water, or lemon juice.

TABLE OF POISONS AND ANTIDOTES

| POISON | ANTIDOTE | TREATMENT |
|---|---|---|
| Acids (such as nitric, sulphuric, hydrochloric, and oxalic) | Soda, magnesia, soapsuds, chalk, lime water. Never give oil. | No emetic. White of egg, water, ice, milk |
| Alcohol | Coffee | Heat to the feet, cold to the head |
| Alkali (as lye or ammonia) | Olive oil, vinegar diluted | Milk, white of egg |
| Arsenic (as lead, rat poison, Paris green) | Milk, white of egg | Emetic |
| Carbolic (Lysol) | Epsom salts, soapsuds, alcohol | No emetic, flour paste |
| Carbon monoxide (automobile exhaust) | Fresh air, oxygen | Artificial respiration |
| Mercury (corrosive sublimate, bichloride of mercury) | Egg white | Emetic, charcoal, milk, barley water |
| Ether | | Artificial respiration |
| Iodine | Flour or starch paste | Emetic |
| Opium | | Emetic, coffee, artificial respiration. Keep patient walking rapidly. |

AN EMETIC is something to induce vomiting, such as mustard and water, in the proportion of 1 teaspoonful to 1 cup of water, or soda and water, in the proportion of 1 teaspoonful to 1 cup of water Lukewarm water is more effective than cold Make the patient drink 2 or 3 cupfuls, no matter how much he objects, and repeat in 10 minutes if necessary This is so difficult with a young child that a teaspoonful of sirup of ipecac may be given instead Vomiting may also be induced by sticking a finger down the throat

Only remedies found in the home are given above The physician may give drugs or wash out the stomach

The symptoms of food poisoning are very similar to the symptoms of appendicitis pain in the upper abdomen, cramps, nausea, and vomiting Before any measures are taken, such as laxative, a physician should be consulted

Nosebleed, or epistaxis The most common causes of epistaxis are injuries, disease, or excitement The patient should hold his head erect or it should be elevated Never allow him to bend over a basin, as this increases the flow of blood Press the nostrils together and apply ice over the nose and at the back of the neck If this does not check the bleeding, the nostrils may be packed with gauze or absorbent cotton If bleeding continues, a physician should be summoned

Sunstroke is caused by exposure to the direct rays of the sun on a very hot day The patient becomes dizzy and faint, is sometimes nauseated, and complains of headache There may be loss of consciousness The patient should be put to bed in a cool, darkened room, the head raised, an ice bag or cold compresses applied to the head, and heat applied to the lower extremities

Heat exhaustion is caused by exposure to any intense heat, either natural or artificial The symptoms are much the same as in sunstroke, and the treatment is the same except that heat is not applied to the lower extremities In either heat exhaustion or sunstroke, a physician should be called, as the consequences may be serious

Frostbite is caused by exposure to extreme cold Chilling of the surface blood vessels interferes with the circulation of the blood The patient should be taken to a cool room and the circulation gradually restored by applying wet compresses at a temperature of 65°F (18 3°C ) or immersing the part in water at a temperature of 65°F The temperature of the water should be very gradually

increased, but great care must be taken not to apply heat in any form until the circulation is restored. If water is not available, warm the part gradually by applying extra clothing or covering with your own hand.

Fainting, or syncope, is caused when, for any reason, the blood is temporarily prevented from reaching the brain. The patient becomes unconscious but will revive naturally. Place patient on his back, preferably with the head lower than the feet. Give plenty of fresh air and keep him quiet and warm. If a person looks as if he might faint, tell him to put his head down between his knees, or push it down for him. This position brings the blood back to the brain.

## *SUMMARY*

Emergencies require immediate action. First aid may be given if the person in charge knows what to do, but, in any event, certain preliminary steps should be taken. Besides being treated for the accident, the patient may need treatment for shock.

The emergencies discussed in this chapter include: asphyxiation, electric shock, burns, bruises, wounds, hemorrhage from wounds, foreign bodies in nose, ear, eye, poison ivy, insect bites, fracture, convulsions, poisoning, nosebleed, sunstroke, heat exhaustion, frostbite, and fainting.

Each emergency calls for specific treatment. Although a general as well as a specific knowledge of what to do is very useful, it is well to consult a text to refresh the memory, rather than to do the wrong thing.

Every nurse should be able to resuscitate a person who is suffering from suffocation caused by choking, drowning, or inhalation of smoke or gas, using the back pressure–arm lift method of artificial respiration as approved by the American Red Cross.

Ready, accurate knowledge of what to do in time of emergency should be a part of every nurse's mental equipment.

### Questions

1. What is first aid?
2. What are the four definite rules to be followed when an accident occurs?

3 What are the symptoms of shock?
4 What measures are sometimes taken to treat shock?
5 Why is tea or coffee often given to accident patients?
6 What are some causes of asphyxia?
7 How can a patient who is choking be helped?
8 What preliminary measures should be taken in drowning accidents?
9 In the back pressure–arm lift method of artificial respiration, what is the position (a) of the subject, (b) of the operator?
10 What is done in the compression phase?
11 Explain the position for the expansion phase
12 Describe the expansion phase
13 At what rate should the cycle be repeated?
14 How should the body of the subject be placed?
15 How should the patient remain after resuscitation until he is seen by a physician?
16 In what situations other than drowning is artificial respiration of value?
17 How may a person be rescued safely if he is in contact with an electric current?
18 After the current is broken, what measures are taken?
19 How are burns classified? Define each class
20 Describe any preparations to be made before the seriously burned person is sent to the hospital
21 How may the flames be extinguished if the subject's clothing is on fire?
22 What emollient may be applied to a burned surface?
23 What treatment may be necessary for extensive burns?
24 Is it best to apply heat or cold to bruises?
25 Define (a) a wound, (b) a contused wound, (c) a puncture wound
26 What danger should be avoided in bandaging a wound?
27 Why should absorbent cotton not be used on a wound?
28 What antitoxin may the physician decide to give to a wounded patient?
29 Under what conditions, only, should a tourniquet be applied as a first aid measure?
30 What should and should not be done if a child has poked a bean, for instance, into his nose?
31 Discuss the removal of a foreign body from the eye
32 What is an effective treatment for exposure to poison ivy?
33 How does one treat a bee or wasp sting?

34. How should a patient with a possible bone fracture be treated before the arrival of a physician?
35. What are some causes of convulsion?
36. What four steps should be taken for a victim of poisoning while awaiting the arrival of the physician?
37. Define an antidote. Give an antidote for an acid, and one for an alkali.
38. What is an emetic? Give an example. How may vomiting be induced?
39. What are the symptoms of food poisoning?
40. What are the most common causes of nosebleed? How may it be remedied generally? What if common remedies fail to stop it?
41. What treatment is given to a patient suffering from sunstroke?
42. How does the treatment for heat exhaustion differ from that for sunstroke?
43. What should be done to relieve frostbite? What does the text point out should never be done?
44. How can a person who seems about to faint be prevented from doing so?

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# PART VII

## *Care of the Mother and Child*

# 38

# CARE OF THE NEWBORN INFANT AND THE WELL BABY

## *THE NEWBORN INFANT*

After delivery of the baby, the doctor ties and cuts the umbilical cord and applies a metal clip to the umbilical stump He also drops a certain solution into each eye, usually a 2 per cent silver nitrate solution This solution prevents the development of a serious eye disease, leading to blindness, caused by the gonococcus, with which the child may be infected from the mother's vagina

In the hospital delivery room, a bead bracelet or necklace is then fastened on the baby to serve as identification The baby's name is spelled out on the beads

Blood and other debris are removed from the baby's face and scalp with oil, but the remainder of the body, with its covering of vernix caseosa, is left untouched At least, this is the technique carried out in most hospitals today It is known as the "dry" technique It is felt that the vernix caseosa serves as a protection from skin infection and also acts as natural skin lubricant After the initial skin care has been completed, the baby is weighed and dressed It is nursed for the first time about 12 hours later, or as soon after birth as the physician directs

Procedure of taking baby to mother in the hospital

The following procedure is carried out every time the baby is taken to the mother to be nursed:

1. Examine the beads for the name.
2. Examine name on the bassinet.
3. Call the mother by name, as a mistake in giving the wrong baby to a mother destroys her confidence in the people taking care of her.

*Note:* Some hospitals require that the nurses taking care of newborn infants wear headgear—usually a cheesecloth turban or special hair covering—mask, and gown. Other hospitals require the use of gowns and headgear only. The type of apparel to be worn by the personnel will be determined by the hospital medical staff.

## *THE WELL BABY*

As no two babies are exactly alike, the same routine is not applicable to all of them. However, most babies are happier if a satisfactory routine is established. Feeding should be at the same time every day. A baby who is picked up and shown to people at a time when he should be quiet or sleeping becomes fussy and irritable, allowing his nurse or mother little time for other duties. The morning bath is the time for play and exercise. This activity should not be hurried, but, once over, the baby should be left alone in a quiet room or outdoors. In the late afternoon he should be undressed and allowed to kick and stretch for half an hour before his evening toilet and feeding.

### HABIT TRAINING

Sleep. For the first few months the baby sleeps 18 to 20 hours out of 24. By the time he is six months old, he is sleeping 16 to 18 hours out of the 24. After the second or third month he should sleep straight through the night from six o'clock feeding to the six o'clock morning feeding. The ten o'clock feeding should be given only if he wakens.

After he is six months old, he has a long nap in the morning and a shorter nap in the afternoon. If he sleeps all the afternoon, he may

not sleep well at night After he is a year old, he will probably have one long nap after the midday feeding, but requires time to rest during the morning and should be left alone and quiet part of this time

**Crying.** A baby can make his wants known only by crying Try to find out if he has any reason for crying He may have air in his stomach, in which case he can be laid on your shoulder and gently patted on the back until he "bubbles" His position may be uncomfortable, he can be turned and his clothing smoothed out, especially the band and shirt (The band is used only until the navel has healed ) He may be thirsty, and a drink of sterile water will satisfy him A pin may be sticking into him, or he may be cold or wet A well cared for baby who is not allowed to lie in wet diapers learns to dislike the dampness and will usually cry after urinating He may be disturbed by outside noises

If he continues to cry after he is made comfortable, he probably only wants attention He should not be carried about or jounced around, but a comforting show of affection is often needed The balance between this amount of attention and spoiling is a delicate one Each baby must be treated on an individual basis

Sometimes the baby is not getting enough food, and he cries fretfully half an hour to an hour before his feedings are due Or he may cry soon after a feeding, which may indicate that his food either does not agree with him, or that the amount has been inadequate In either situation the physician should be consulted

**Stools** The baby's first movements are known as *meconium,* a dark sticky substance which stains the diaper A piece of soft linen or a paper substitute should be placed in the diaper to receive the meconium and burned after use The normal stool of a breast fed baby is buttercup yellow in color, of a soft consistency, and with a slightly sour odor Sometimes the stool is green and contains mucus, if the baby is well, no attention need be paid to this condition A breast-fed baby usually has more frequent movements than a baby fed artificially

When cow's milk is given, the movement is a lighter yellow, is more formed, and has a cheesy odor When other foods are given, there are variations of color, consistency, and odor

To find out if the baby is well and if his food agrees with him, watch the weight and stools carefully Any disturbance of digestion

will show in the stool. Mucus, curds, blood, froth, change in color or consistency, or change in odor should be noticed and reported to the physician.

The number of stools a day varies widely. Most babies have three or four bowel movements daily. Some babies have only one stool in two or three days. Laxatives should not be given except by order of a physician.

After each movement, the buttocks should be carefully cleaned with oil or warm water. Wipe away from the vulva of a girl baby to avoid any chance of infection from the feces.

Babies' skins are very delicate and easily become chafed or irritated or infected. As wet or soiled diapers are the most common cause of chafing or irritation, diapers should be changed frequently. The skin must be kept clean, and all eruptions attended to at once.

Care of genitals. The genitals of a girl baby should be cleaned daily by separating the labia with the fingers of one hand and wiping with a small piece of absorbent cotton dipped in clear water.

The physician will examine the boy baby to see if the penis is normal. The foreskin should be retracted often enough to keep the penis clean beneath it.

If the foreskin does not slip back easily or if the genitals in either a boy or girl baby are inflamed, the fact should be reported to the physician.

Thumb-sucking. All babies suck their thumbs or fingers at one time or another. It generally is not necessary to do anything about thumb-sucking since the habit is given up naturally as the sucking instinct disappears.

When this instinct persists after the bottle has been given up, it usually means that the baby is dissatisfied or unhappy for some reason. It is an escape for him and gives satisfaction which should be obtained by other and new experiences. It is a matter which should be talked over with the baby's physician, who can advise the best procedure to follow for the individual baby.

Restraint should not be employed except on his recommendation.

Toys. A baby investigates everything by trying to put it into his mouth. He should have washable toys which should be cleansed often. Only one or two toys should be allowed at a time.

Toys, if painted, should be free from lead. Celluloid toys should

be avoided, since they break and the small bits may be caught in the lungs. Rubber toys with a whistle are also bad, since the whistle may come out and be swallowed.

Toys for the infant should be large enough to prevent his getting the entire article into his mouth and should be free from any removable small parts, such as shoe-button eyes, which might work loose, be put into his mouth, and swallowed or aspirated.

## DEVELOPMENT OF THE NORMAL BABY

Weight. At birth the baby weighs about 7 pounds. The normal gain is 5 to 8 ounces a week until the baby is about five months old; after this time the gain is less regular.

At five or six months the baby usually weighs twice as much as at birth, and at twelve months three times as much as at birth. At the end of the second year, the baby usually weighs about 25 pounds.

For the first few days after birth, the baby may lose weight because he is getting accustomed to new conditions and because the mother's first milk does not supply much nourishment.

The only accurate way to judge whether or not the baby is getting enough food is by his weight. A baby who makes a steady gain is usually eating an adequate amount of food.

The mother should not be troubled if her baby does not conform exactly to standards, for every baby cannot be expected to gain in weight or to grow in exactly the same way. When there is a marked loss or gain in weight, the physician should be consulted.

Height. The length of the newborn baby is about 20 inches. When he is a year old, he has usually grown about 8 inches. In the second year, he will grow about 4 inches.

Muscular growth begins immediately after birth. The bedding and clothing should be loose enough to allow the baby to move freely.

The *fontanels* are two soft spots on the baby's head—one anterior and one posterior—where the bones have not yet united.

Hair. The baby's hair comes out when he is about six weeks old. The second hair is coarser and may be of quite a different color.

The development of the intelligence. The behavior which is most highly developed at birth is grasping. The baby notices very little

until he is two months old. His eyes should be shaded from the direct rays of the sun and from electric light.

Hearing is imperfect immediately after birth and remains so until all the debris has been cleaned out of the ears—a period of some few hours. Afterwards hearing becomes very acute and the infant responds to the slightest noise.

**The development of some of the glands.** The tear glands are not developed until the baby is about three months old; thus, when he cries, he does not shed tears.

Since the sweat glands are not developed until he is a few weeks old, at first he does not perspire.

The salivary glands are also undeveloped at birth, but at about three months the baby drools constantly because he does not know how to take care of the increased flow of saliva. This drooling is not caused by teething.

**Teeth.** The first teeth begin to appear when the baby is between five and eight months old, and he usually has six teeth at the end of the first year.

The two lower middle incisors are generally the first to come. Then come the four upper incisors, next the two lower lateral incisors, and, sometimes before the fifteenth month, the four anterior molars.

The four cuspids or canines, upper and lower, and the four posterior molars are usually cut by the time the baby is two and a half years old. There is a great deal of difference in the time teeth appear in different children.

The baby is not made ill by teething, though he may be a little irritable when the teeth are pushing through. Any disturbances, such as vomiting or diarrhea, at this time are due to some other cause and require the attention of the physician.

Various recommendations have been made as to the most desirable time to start brushing a child's teeth. Some authorities say "as soon as the molars appear"; others advise, "Wait until the child can and wants to handle the toothbrush himself." The latter plan would seem to be best for the child and the parents.

**Muscular and mental development.** During the first year the baby learns to do a great many things. He usually begins to hold up his head at four months. He grasps objects at three or four months.

At the same age he begins to recognize people who are constantly with him and he knows who feeds him At three or four months he can roll over on his side and at six months he can roll over completely

At nine months he is able to distinguish people He sits up alone between the seventh and ninth month At thirteen months he can say a few words, and at two years he is able to form sentences

A baby shows the first desire to walk when he pulls himself up in his pen or by the aid of a chair He should be left to himself and not encouraged to walk He will usually walk alone by the time be is eighteen months old, often much earlier

## PROCEDURES IN BABY CARE

Bath The daily bath is usually given one half hour before the ten-o'clock feeding

The baby is not put in the tub until the navel is entirely healed and dry, but is bathed or given a sponge bath with warm water

*Care of the cord* Until the umbilicus or navel is healed, it is covered with a dry sterile dressing No one should touch the umbilicus with the hands The dressing is kept in place with a flannel band firmly pinned at one side or the front with tiny safety pins placed one inch apart

The cord usually falls off in about a week, though sometimes it takes longer The navel is moist for a number of days The attention of the physician should be drawn to the navel until it is thoroughly healed

*Temperature of room and water* The temperature of the room in which the bath is given should be about 72°F (22 2°C )

The temperature of the bath water for a young baby should be 98° to 100°F (36 6° to 37 7°C ), this temperature being kept during the entire bath This can easily be done by having a pitcher of very hot water at hand and adding a little water from time to time Test the water with a bath thermometer If you have no thermometer, you may judge the temperature by putting your elbow in the water The skin in this region is more sensitive to heat or cold than the hand Before beginning the bath, have everything collected and arranged conveniently and wash your hands

*Equipment*

Bathinette or
Table covered with pad or blanket, and tub
Bath apron
Bath towel
Face towel
2 washcloths
Mild unperfumed soap
Tube of lanolin
Petroleum jelly
Mineral oil or baby oil
Safety pins
Jar of sterile absorbent cotton
Bath thermometer
Warm sterile water in a cup or bottle
Spoon
Pitcher of hot water
Paper bag
Pail or basin for soiled clothing

*Clothing*

Diapers
Shirt
Slip or nightgown
Knitted or flannel blanket

*Procedure.* Put on a bath apron. Be sure your clothing is free of pins which might scratch the baby.

Pour water into the bathinette or tub.

Lay the baby on the top of bathinette or on the table, and undress him. Always remove clothing by drawing down over the feet. This is a good time to weigh the baby. He should be weighed once a week and the weight recorded.

Wash the face with clear water, then dry. Special eye care is necessary only if there is discharge present. Then absorbent cotton, moistened in water, is used for cleansing the discharge. Be sure to wipe away from the nose and use a fresh piece of absorbent cotton for each eye, discarding cotton into paper bag after use. A baby's ears can be washed when his face is washed. Do not try to poke into them with anything other than a soft washcloth.

The inside of the nose does not need washing. If there are any crusts in the nose, they may be softened with oil and later removed with oil and absorbent cotton.

The baby's mouth does not need any special care but should be inspected daily to be sure of its cleanliness.

SHAMPOO FOR INFANT Lather the baby's scalp thoroughly with your hands, then, holding him up with his head over the side of the basin or tub, dip the washcloth into the water and rinse his scalp quickly In this way you can wash his head without getting soap into his eyes Do not be afraid to wash thoroughly the top of the baby's head By good daily care, 'cradle cap" may be prevented (If cradle cap does form, rub in petroleum jelly or oil each night and wash the head thoroughly in the morning ) Then go over the entire body with a soapy washcloth, or your hand well soaped, wash well under the arms, in the groin, between the fingers and toes, and in all creases

Put the baby in the tub, support his head with your left arm and grasp his shoulders with your left hand This leaves the right hand free to rinse his body Take care not to allow any water to get in his ears Let him kick and splash a moment on his back, then turn him on his stomach with your left hand under his chest to prevent his face from getting in the water

Take him out of the tub and wrap in a bath towel Lay him on the table and gently pat his body dry, being careful to see that no moisture is left in the creases or folds of his skin

Apply oil under the arms, in the groin, and to the buttocks to prevent chafing

The fingernails should be kept clean and cut short so that the baby can not scratch himself The toenails should also be cleaned and cut short, straight across

Dressing the baby. The baby's clothing should be put on deftly and gently, without constantly turning and moving him about First take the baby's hand and pull on the shirt sleeve, roll the shirt under his body, at the same time turning him slightly, and pull the other arm through Slip the diaper under the buttocks and pin firmly to the shirt Then put on the nightgown and wrap the baby in a soft blanket

Sponge bath In hot weather it refreshes the baby to give him another bath in the late afternoon This is a mere sponging over with warm water while the baby lies on the bath table At night the face and hands should always be washed, and the baby may be sponged all over at this time Have fresh clothing ready to put on at night (*Note* Since more and more we are advocating that the father participate more actively in the baby's care, the evening

sponge bath might prove a good time for his initiation, if he wants to cooperate. Some fathers might prefer getting the "feel" of the small baby by helping with the feedings, by changing the diapers, or by just picking him up and walking around with him when he seems to need a little extra attention.)

Every time the baby bas a bowel movement or urinates, his buttocks and genitalia should be cleansed with clear water and mineral oil or baby oil. Use absorbent cotton and discard after use. Do not leave soiled or wet diapers in the baby's room. There should be a special receptacle for them in the bathroom.

Cbange of position. Remember that it is just as tiresome for the baby as it would be for you to lie in the same position all the time. If he was lying on his right side when taken up, put him back in bed on his left side. Most babies sleep well on the stomach.

To weigb a baby

*Equipment*

Weight scales with scales pan
Diaper
Pencil and paper

*Procedure.* Cover the scales pan with the diaper, and balance the scales.

Undress the baby and place him in the scales pan.

Read the weight, keeping one hand directly above the baby and watching him carefully to prevent the possibility of his falling off the scales.

Remove the baby and the diaper from the scales pan and record his weight.

*Note:* Weights should be taken at the same time each day. Weighing him before his morning feeding at one time and after it at another will not give a true picture of his daily gain or loss. In the home it is best to weigh him just before putting him in the tub.

To measure a baby (under two years)

*Equipment*

Tape measure

*Procedure.* Undress the baby. Hold him by the heels with his head resting lightly on the bed. Extend the tape measure from heel to head along the baby's back and note the distance measured.

To make a closed crib or bassinet
*Equipment*

| | |
|---|---|
| Large rubber or plastic crib sheet | Bed blanket |
| Two sheets | Spread |

*Procedure* Place chair near foot of crib with the seat turned toward the head of the crib and arrange clean linen in proper order for use on the seat of the chair

Straighten the mattress on the springs and pull to the head of the crib Cover the entire mattress with the rubber or plastic sheet and tuck it in on all sides

Place the bottom sheet in position on the crib, allowing enough at both ends for tucking under the mattress (If the sheet is not long enough, let the deficiency come at the bottom, bringing the lower hem even with the end of the mattress ) Tuck the sheet under the top of the mattress Pull the sheet tightly toward the foot of the crib, and tuck it smoothly under the foot of the mattress

Place the clean lower sheet (former top sheet) on the bed Tuck under at the head and the foot of the mattress miter the corners, and tuck in at sides

Place the top sheet in position on the crib, even with the head of the mattress, and tuck under the mattress at the bottom Miter the corner and tuck the sides under the mattress

Place the blanket in position, 8 inches from the head of the mattress and tuck under the mattress in the same manner as the sheet

Fold the top sheet back as an 8 inch cuff over blanket

Place the spread over the head of the mattress, unfold, tuck under the foot of the mattress Miter the corner, then tuck under the mattress

Put up the crib side

Go to the other side of the crib and complete the procedure

Pull up the crib side

Replace the chair beside the bed

To make an occupied crib or bassinet
*Equipment*

| | |
|---|---|
| Sheet | Laundry bag |
| Spread | Pillow case |

*Procedure*. Place laundry bag at the foot of the bed. Arrange the linen in the order in which it is to be used and place it on the seat of the chair.

Remove the pillow. Discard soiled case in the laundry bag.

Pull the mattress up to the head of the bed as far as it will go. Loosen all linen, starting at the opposite side of the crib. Remove the spread, then the blanket, placing them on the back of the chair.

Place a clean top sheet on the child, removing the soiled top sheet.

Turn back an 8-inch cuff on top sheet.

Make sure the sheet is pulled well over the baby's shoulders.

Shift the baby slightly beyond the center of the bed, allowing him to remain on his back or side as he desires.

Tighten the rubber crib sheet.

Place clean lower sheet (former top sheet) on the bed. Tuck under at the head and at the foot of the mattress; miter the corners and tuck in at sides.

Carry the end of the top sheet under the foot of the mattress. Miter the corners and tuck in the sides.

Complete putting on the top linen on the near side, leaving it loose over the child's toes.

Shift the baby toward you and ease him onto the completed side of the crib.

Put up the crib side, seeing to it that it is fastened securely.

Discard the soiled sheet in laundry bag and complete making that side of the bed.

Have the baby in a comfortable position.

Put on the clean pillow slip and replace the pillow.

Put up the crib side.

Place bedside stand next to the crib.

Bring back of chair up to the side of the table.

Remove the laundry bag and dispose of the soiled linen.

*Note:* Be sure both crib sides are up and securely fastened.

Sun bath. Sun bathing is beneficial when done intelligently, as the direct rays of the sun aid in the normal development of the bones.

The sun bath can be given by an open window if the sun strikes directly on the baby. The physician will prescribe sun baths. Begin by exposing the legs for a short time. The first exposure will be for only a few minutes at a time, then gradually increased daily until the

whole body is given 15 minutes on the front and 15 minutes on the back. Always protect the baby's eyes from the direct rays of the sun. In the summer, the sun bath can be given outdoors, but if it is very hot weather, this should not be done in the middle of the day.

**Outdoor air.** The baby should spend part of every day outdoors if the weather will permit and a suitable place is available. He can be put out for his morning nap and again for his afternoon nap, as long as the temperature is not freezing and wind is not bitterly cold.

In winter, the best time to have the baby out is in the middle of the day. In the summer, the best time is in the first part of the morning and the end of the afternoon. Do not put him out on a windy day, on account of the dust. When it is inadvisable to take him outdoors, dress him as if he were going out, and put him in the baby carriage in a room with the windows open. This is also a good way to accustom a tiny baby to the outdoor air.

The baby must be kept warm but not weighed down with heavy clothing. The baby's body radiates heat, so it is necessary only to keep in the heat and prevent the cold air from getting into such spaces as around the neck and up the sleeves.

Form the habit of feeling the baby's feet. If they are cold, you will know that the covering is insufficient.

**Bedcovers and clothing.** All blankets, sheets, and quilts should be large enough to tuck securely under the mattress, so that there is no danger of their coming loose and working up over the baby's head. Sleeping bags are extremely helpful in keeping the baby covered throughout the night. However, some sleeping bags are rather hazardous to use—especially those that close tight at the neck with a zipper, the danger associated with anything which is constricting about the neck should not be overlooked. There is a type of sleeping bag available, however, which reaches up to the baby's armpits and is pinned snugly around him. A sweater or two will keep his shoulders warm.

**Baby's room.** The nurse cannot choose the room for the baby, but she has the responsibility of keeping it spotlessly clean, well aired, and at the proper temperature. The baby should not sleep in the same room with other people if it can be avoided. The temperature of the baby's room should not be above 70°F. (21.1°C.) in the daytime. At night the room may be quite cool if the bed is screened so that the air does not blow directly on the baby. It may be as cold

as 52°F. (11.1°C.). Do not judge the temperature without a thermometer, which should be hung near the floor, especially after the baby begins to crawl around.

Since the baby needs all the sun he can get, it is necessary in choosing his room to have at least one window with a sunny exposure. The room should be thoroughly aired once a day, the bed stripped, and all bedclothing aired by an open window. Be sure that the bedcothing is thoroughly warmed before the baby is put back in bed. Once or twice a week, the mattress should be given a good sunning outdoors.

The baby's room should be adequately screened to exclude flies; they are dangerous, as they carry dirt and germs and contaminate everything with which they come in contact. Even outdoors the baby must be protected from flies and mosquitoes. A large piece of netting should be firmly fastened over the baby carriage.

**Laundering infant's clothing.** Washing for a baby is an important part of his care, for clothes not carefully washed may cause irritation to a baby's delicate skin.

The water for washing should be soft. Hard water contains an excessive amount of mineral salts. When hard water is used with soap, insoluble substances are formed and float on the surface of the water. This leaves the clothes gray and often sticky. Water may be softened by adding a commercially prepared water softener.

Soap is made from caustic soda and fat. Mild soaps contain no free caustic soda, injurious to clothing and to the skin. Therefore only mild soaps should be used in washing the baby's clothing, and care should be taken to rinse out every particle of even mild soap.

*Washing the baby's cotton clothing.* Use hot water; soften if necessary. Dissolve the soap thoroughly in water. Do not rub soap on the garment. Wash thoroughly by squeezing the suds through the garment. Rinse three or four times in hot water. Any soap left in the garment will irritate the baby's skin. Dry outdoors and in the sun, if possible. Iron.

*Washing woolen garments.* Dissolve soap thoroughly in hot water. Soften water if necessary.

Add cold water to make lukewarm and keep all other waters at the same temperature. Whip to make strong suds.

Immerse woolen garments and squeeze suds through them until

they are clean Sometimes two washings are advisable if the garments are very soiled Never rub or use a washboard Gently squeeze the suds out of the garment Never wring by hand or use a heavy wringer Rinse twice in two waters of the same temperature as the wash water Use a squeezing motion Do not wring

Dry the garments in a warm place but never in the hot sun, near a hot stove or radiator, and never allow to freeze

Iron on the wrong side, if necessary, with a warm iron, or press on the right side with a damp cloth over the garment

Do not hang up any knitted garment, such as a sweater, but spread it on a flat surface to dry Take the dimensions—that is, the length and width of body and the lengths of sleeves—before it is washed, then, after laundering, shape into the same size for drying It will dry in exactly the form in which you shape it

*Care of diapers* All used diapers should be washed once a day Keep two covered pails, one for wet, and one for soiled diapers

As soon as the diaper is removed, it should be placed in a covered pail full of cold water until ready to wash, unless it is soiled with fecal matter

Diapers soiled with feces should be immediately brushed off over the toilet with a small wire brush or knife kept for this purpose, before being put in the pail for soiled diapers, which should contain soapy water

The soiled diapers should be washed separately, first pouring off the water in which they have stood

Scrub all diapers in hot soapsuds until they are clean If water is hard, soften it with water softener

Rinse once, then cover with cold water, allow to come to the boiling point, and boil for five or ten minutes

Rinse thoroughly at least twice more if water is not clear

Dry outdoors if possible

If a stain on the diaper is persistent, wash out again and hang dripping wet in sun

Diapers or clothing wet by urine should never be dried and used over again, without first washing them

Rubber pants are irritating to the baby's delicate skin and should be worn only when he is traveling

It is not necessary to iron the diapers, they can be pulled into shape and folded ready for use

Be sure the diapers are thoroughly dry and warm before putting them on the baby.

Suggestion for a routine day

| | | |
|---|---|---|
| A.M. | 6:00 | Breast or bottle feeding<br>Put on baby's dry clothing before feeding. After feeding, put baby back in bed. |
| | 9:00 | Cod liver oil, followed by orange or tomato juice |
| | 9:30 | Bath |
| | 10:00 | Feeding |
| | 10:20 | Morning nap, out of doors if possible. Give drink of water after the nap. Sun bath may be given after the nap. |
| P.M. | 2:00 | Feeding |
| | 2:20 | Afternoon nap, out of doors if possible. Give drink of water after the nap. |
| | 5:00 | Undress and allow to kick and play on bed.<br>The physician may order cod liver oil, tomato juice, or orange juice to be given at this time. |
| | 5:30 | Wash face and hands and put on nightgown. |
| | 6:00 | Feeding |
| | 6:20 | Put in bed, lights out, and windows open according to temperature. |
| | 10:00 | Feeding |
| A.M. | 2:00 | Feeding—which should be discontinued as soon as the baby sleeps all night |

Points to remember in the private home

Do not make the mistake of trying to bring hospital routine into the home. Remember that the mother has a right to do as she chooses with her own baby.

It may be more convenient for the mother to adopt hours different from the hospital schedule of feeding or bathing the baby, but as long as the routine is regular, this variation will do no harm.

Do not attempt to instruct the mother. If she asks for advice, make suggestions only.

Always wash your hands before doing anything for the baby.

Weigh the baby at least once a week. If he is losing weight or does not gain, consult the physician.

Watch the stools and report the slightest abnormality to the physician.

Never give medicine unless ordered by the physician, and never take the responsibility of making any change in the baby's food.

If the baby spits up, notice whether he does so before or after his feeding and report to the physician.

Watch for any rash or chafing.

Never allow anyone to kiss the baby on his face, and never take him near anyone who has a cold or any other illness.

Keep the baby away from crowded places and excitement. He thrives in a quiet, calm atmosphere.

## *SUMMARY*

The umbilical cord, the navel, the scalp and head are cared for soon after birth, but the infant's body is not washed for some time, on the theory that the vernix caseosa serves as a protective covering.

Great care is taken to ensure the identification of the baby and to see that each mother receives her own baby when a baby is brought to her bed.

Babies respond well to routines, therefore, although all schedules are not alike, the baby has soon established regular feeding, sleeping, and bathing habits.

When the baby cries, the nurse tries to discover the reason.

The baby's stools reveal much about his digestion. They are examined, noted, and reported, especially if unusual in any way.

Baby's skin is very delicate, and gentle care must be given to keep it clean and free from chafing. The genitals are given frequent care—always after elimination.

Weight is taken at the same time of day to make accurate comparisons. Growth is measured and recorded. The development of senses, glands, and intelligence is an unending source of interest to all around him.

A bath is given daily, after the navel has healed, with room and air at the proper temperature. To bathe the baby properly is one of the chief skills which the young mother or nurse is eager to develop.

Another important procedure is to make up his crib—occupied or unoccupied.

Exposure to sunlight for short periods at a time is beneficial, although the direct rays of the sun should not shine in his eyes. Provision for outdoor naps, when the weather permits, are the rule.

Baby's room should be kept scrupulously clean, well aired, and screened against insects. His clothes and bedding should be washed

in soft water and dried in the sun. His diapers require especial care to keep them fresh and soft for further use.

Caring for baby throughout the day will go along more smoothly when a schedule is made; but the strict hospital schedule cannot be used in most families, and the mother's wishes and plans will be taken into consideration at all times.

## Questions

1. How is the newborn baby protected against blindness?
2. How is the baby identified?
3. Give three or four likely reasons why a baby may cry.
4. Describe a normal stool of a breast-fed baby.
5. Discuss thumb-sucking in an infant.
6. How can one judge if a baby is getting enough nourishment?
7. In what order do a baby's teeth come through?
8. Should a baby be encouraged when he first shows a desire to walk?
9. Why is a newborn baby not given a tub bath for some little time?
10. To what areas should oil be applied after bathing?
11. Describe the procedure of making a closed crib or bassinet.
12. How can a baby take his nap in cool fresh air when it is too cold to let him sleep outdoors?
13. How can one easily tell if a baby has enough covering?
14. Discuss the "pros" and "cons" of sleeping bags for infants.
15. Describe how baby's woolens should be washed.
16. What kinds of toys are suitable for an infant? What kinds are not suitable?
17. When only may the crib sides of an occupied crib be lowered?

# 39

# CARE OF THE SICK CHILD

Illness in any human being is mentally disturbing. The sick child has no understanding of the sudden change in his feeling, nor of the unusual restriction of his activity. This lack of knowledge is very likely to make him angry or afraid and consequently difficult to handle. An ordinarily sweet tempered, obedient child may fight and kick and scream. He may say "No!" to everything. On the other hand, an independent, strong willed youngster may be so frightened by his queer feelings that he becomes docile and weepy. He craves an unusual amount of love, tenderness, and cuddling to reassure him.

It is your job to relieve his anxiety and ease his pain and discomfort. You must, at the same time, always maintain a matter of fact attitude about care and treatments, nourishment, and rest.

The first step is to gain the confidence of an acutely sick child by quiet talk and explanation. He should never be reprimanded for his bad behavior. Even if he seems too young to understand what you say, the tone of your voice and your continuously repeated statements about what you are doing for him and why you are doing it will calm him and make your task easier and more enjoyable for you both.

If it is necessary for anyone to perform some unpleasant or painful procedure, you should remain with your patient. Explain simply that the doctor, for example, wants to find out what is making him sick. You may hold his hand while "it hurts." If you have gained his confidence, you will be proud of his behavior. Never

let him down by insincerely saying "It won't hurt," or by being too busy to talk to him.

Most illness in children occurs in the first six years. Of that age group, those mostly affected are children two and one half years or younger. This latter group cannot tell you where they hurt, what they want, or how much they appreciate what you do for them. In order to be a real aid to the doctor, watch the young child carefully, anticipate his needs, and observe the child critically when he is either awake or asleep.

Signs to observe include the following:

1. Does the child assume a peculiar posture, arch his back, curl up, or the like?
2. Is there a different pitch to his cry; is it shrill, hoarse, or weak?
3. Does he seem to have difficulty in swallowing?
4. Does he regurgitate through his nose?
5. What type of cough does he have—is it tight, barking, loose, or deep?
6. Is he restless? Does he look frightened?
7. Does he pull or scratch his ears or head?
8. Does he turn away from the light?
9. Do his fingernails and lips look bluish?
10. Does he cry when certain parts of his body are moved or touched?

If you are required to give medications, read the directions carefully; remember that children cannot complain to the doctor about an overdose or protest that they have been given the wrong medicine.

Give medicine without hesitation, in a matter-of-fact, straightforward manner.

Large pills may require crushing in a spoonful of sirup. Unpleasant liquids may sometimes be disguised in a small amount of fruit juice, honey, or Karo. If you are not sure you have adequately disguised the medicine, mix a little and taste it yourself. Follow with something the child likes to drink.

## *GENERAL CARE OF THE CHILD*

The room should be warm—temperature about 74° to 76°F. (23.3° to 24.4°C.). When windows must be closed to prevent a draft, air the room frequently. The child's clothing should be light

yet warm—he could wear a sweater or bathrobe or have a blanket over his legs His temperature should be taken by rectum every four hours The fluid intake and output should be watched and recorded You should report all vomiting and bowel movements Describe the amount, color, odor, consistency, and time Save any specimen of vomitus or stool if it appears unusual Notice if the child seems to be in pain Report any discharge, bloody or otherwise Children's temperature should always be taken by rectum Bathe the child at least once daily and repeat if he perspires profusely Help the child on and off the toilet Assist with his feeding and offer fluids frequently Arrange his playthings conveniently for him, but give him only those which are suitable for him in his illness Let him nap and rest without being disturbed Observe all his activities and symptoms closely but unobtrusively, so that you can report them to the doctor

Try to avoid emotional crises Do not say bluntly, "No, you can't" or "You must" do so and so Rather, attract his attention to something more suitable, such as "Let's cut out pictures of cars so you can get well quickly," instead of "No, you can't get up and play with your train or you will get sicker"

## THE CHILD WITH ACUTE ILLNESS

Generally children come down with an acute illness very suddenly They are apparently well one minute and can be desperately ill an hour later The signs and symptoms of almost any acute illness in childhood will be associated with fever, nausea, vomiting, with or without diarrhea, great weakness, and discomfort They merely indicate that the whole child is sick, not just his throat, or ear, or bowel The first group of three or four symptoms lead rapidly to dehydration and, if persistent, will make the disease more severe than necessary and have a bad effect in themselves For this reason, it is well for the nurse to master a few basic procedures which will tend to relieve the dehydration, keep the temperature under control, and alleviate pain

Dehydration is the loss of water from the tissues of the body The water is drained away rapidly through the stomach when there is excessive vomiting, through the bowel when diarrhea is present, and through the skin when there is high fever or sweating One of

the best indicators of dehydration is scanty, infrequent, and concentrated urination. Try to maintain a good urine output. To accomplish this it is best to offer small amounts of tolerated liquids frequently. Large amounts may cause nausea or aggravate vomiting. Fluids such as water or sweet tea (1 quart of boiled water in which are steeped 2 teabags to which are added 3 tablespoons of Karo sirup) can be offered in 2-ounce quantities, every 15 to 20 minutes while the child is awake.

After an episode of vomiting, giving nothing by mouth for two hours, then begin with 1 teaspoon of sweet tea or other liquid. In 15 minutes give 2 teaspoonfuls and so on, gradually increasing until an ounce is tolerated; then proceed as above. If vomiting should reoccur, the doctor should be notified. In the meantime, repeat the previous treatment. The child loses more fluid by vomiting than you can possibly replace by his drinking if you force liquids and his stomach remains in a turmoil. Try to avoid milk and milk foods when there is vomiting and/or diarrhea. If it should be demanded and all other liquids refused, then be certain to use skimmed milk rather than give nothing.

In the acutely ill child never encourage or force solid foods. The child will demand a real meal as soon as his body says he can tolerate it.

Fever and convulsions. *Fever* is a reaction of tbe body to invading organisms and disease. A certain amount of fever may be helpful to the body in overcoming the invader. Oceasionally the temperature gets out of hand and affects the nervous system, causing what is known as febrile convulsions. These are seen fairly frequently at the onset of high fevers in small children.

If signs of *convulsions* are present, such as fine twitching of the hands or feet or rolling of the eyes and sometimes stiffening of the body, get in touch with the doctor immediately. In the meantime, if his temperature is elevated to 103°F. (39.4°C.), strip him and sponge his body with lukewarm water. Allow the moisture to evaporate from the skin, thus cooling him. When the sponging is completed, cover him with a light-weight blanket.

Since the child is irrational or unconscious during a convulsive seizure, *it is necessary to stay with him constantly* and prevent him from harming himself. A tongue depressor slipped between the teeth will prevent him from biting his tongue. The doctor may order

a cool tap water enema If it is expelled it should be repeated slowly

Do not try to give a convulsing child anything by mouth until he is conscious and begins to look around and has relaxed his spasm Then give him as much cool liquid as he will take, preferably water or sweet tea He may vomit once following a convulsion

During a chill the child says that he is cold, although his temperature is climbing His teeth will chatter and his skin will become cold and clammy Cover him well with blankets until he begins to feel warm, then gradually remove the warm covers Give him a drink of warm milk or cocoa and call the doctor

General weakness follows rapidly after the onset of an acute illness in childhood The nurse should be very much aware of this fact when caring for her small patients Anything he can and will do for himself he should be permitted to do, unless contraindicated by the nature of his illness or the doctor's orders However, he should be given all the help he wants, such as lifting him to a sitting position, helping to the toilet, feeding him if necessary, holding a full glass for him to drink Frequently a child would drink plenty of liquids which are set beside his bed, except that he hasn't the strength to roll over, sit up, reach for and hold the glass He used to do it, without anyone's thinking about it, but now it just isn't worth the effort

Many children who have well established toilet habits will suddenly revert to bed soiling when they are ill Do not scold or criticize a child for his apparent laziness or reversions Gently help him through this period of weakness with reassurance He doesn't like to lose his independence any more than you would He should not be made to feel ashamed, he already does

## *COMMON MALADIES OF CHILDHOOD*

Pain is any disturbance of normal sensation which causes suffering or distress Very few children are neurotic When a child complains of pain, he generally has pain and he looks to the adults around him for relief

Headache is rare in childhood and if present is a serious complaint The doctor should be notified immediately. The older child

can try to describe his pain, but the nurse has to sense the headache of the infant or young child. He may pull his hair or his ears, or rub or roll or bang his head on the bed. His eyes are dull and his cry may be a small high-pitched whimper instead of the usual lusty yell.

Earache is probably one of the most excruciating pains in childhood and is all too frequent. It is invariably associated with a cold and stopped-up nose, and it usually occurs at night. The doctor should be notified. Do not put anything in the ear unless ordered by the physician.

Sore throat and cough is recognized by a change in the character of the voice or cry. Infants may refuse to suck on the bottle but will take fluids from a cup and may continue to eat solids. The child should be seen by a doctor because of the many different infections which cause sore throat. His directions are to be followed. Lukewarm liquids are usually the most relieving and should be given frequently as much for their lubrication of the throat as for their internal value.

**Croup.** If a croupy, tight, barking cough arises suddenly in the night the doctor should be called; meanwhile, provide warm moist air with a large open pan of water on a hot plate in the child's room, or move the child's bed to the kitchen and simmer water on the stove, or temporarily take the child into the bathroom and run the hot water in shower or tub while the steam kettle is being set up in the bedroom or kitchen. (See croup-tent procedure in Chap. 35, "Administration of Medicines.")

If the room becomes very warm, be sure to remove extra clothing and bedding. If it is a case of simple croup, the child is usually kept in warm moist air for three days and nights, as croup has a tendency to recur nightly.

If there is little or no relief after two hours in a steamy atmosphere and if fever is present, the child must be seen by a physician immediately as it may indicate laryngeal diphtheria or severe tracheobronchitis, and specialized treatment should not be delayed.

Whooping cough is discussed in Chapter 54, "Some Communicable Diseases."

Stomach-ache is a familiar complaint with children. When a child doesn't feel just right, he will frequently say he has a stomach

ache He probably means that he is nauseated Watch carefully for more localizing signs He is probably coming down with a cold or a contagious disease, but it may be due to an emotional upset or just plain overeating Take the temperature, put him to bed, and watch for nausea, vomiting, or bowel irregularities. Offer only clear liquid and soda crackers until you either have something definite to report to the doctor or the child gets up and demands food Pains and symptoms persisting more than two hours are likely to indicate definite disease within the abdomen and the child should be seen by a physician

Pain on urination usually causes the infant to cry out sharply each time he wets his diaper The older child will try to hold back and will grimace when he finally urinates Most older children will complain Obtain a urine specimen as soon as possible and have the child seen by his doctor Forcing fluids and juices, in the meantime, will help, and a warm sitz bath for half an hour may give relief, as the cause is most frequently a crust formation or an infection at the urethral meatus

Pain on defecation is usually associated with constipation. The physician should be consulted regarding diet and treatment Lubricating the anus with oil or petroleum jelly at the time of the movement will give temporary relief

Pains in the muscles and joints are common in young children They are not growing pains Most frequently pains in the legs are due to mechanical abnormalities, such as flat feet or weak ankles or knock-knees A certain percentage will be due to rheumatic fever These pains should be called to the attention of the physician The pains from knock-knees usually occur at night following a strenuous day of play Relief may be obtained by rubbing and massage The pain of a rheumatic joint responds little to external application, but requires medication, prescribed by the doctor Children with the latter must have bed rest and careful medical supervision, while the large group of children with mild mechanical abnormalities should continue their normal activities

Head injury might almost be called one of the major childhood diseases Hardly a single child grows up without sustaining at least one fairly shocking head injury Babies between 3 and 19 months roll off beds onto the floor Toddlers fall frequently, and all babies seem to land head first, as the head is relatively the heaviest seg-

ment of the body. Older children sustain head injuries while playing outside. Roller-skating and bicycle accidents are frequent causes of head injuries.

Luckily, most children have little or no severe damage. However, many skulls are fractured and many concussions result from head injuries which do not appear severe at the moment. If a child cries immediately and soon goes back to his play, he is probably not seriously injured, but he should be watched over the next few hours to be certain he doesn't gradually become drowsy or vomit. It is wise to encourage the child to lie down quietly for a while to allow his brain to adjust itself again. Never try to keep the child awake when it is his normal nap or sleep time. Check him every half hour for a couple of hours to be sure you can rouse him and check his pulse and respiration. If there is unusual drowsiness (when he should normally be wakeful), stupor, vomiting, slowing of the pulse, or irregular respiration, notify the doctor and get the child to the hospital as soon as possible.

The child who is temporarily stunned by the fall does not cry and will stop breathing momentarily; he looks pale and bluish before he takes a breath, and then gradually responds. Frequently he will vomit in a few minutes. The physician should be called and the child put to bed. Usually it means only a mild concussion, but you should watch for the symptoms listed above. Patients with head injury should never be given any form of sedative or opiate.

## THE CHILD WITH CHRONIC CONDITIONS

It is important to remember that in children who have had a streptococcic infection, such as streptococcus tonsilitis, scarlet fever, or streptococcic infection of the skin, some complications may develop in from 7 to 21 days, although all signs of acute infections have subsided and the child is apparently well. A critical and objective appraisal of the child every day or two, after he has resumed his normal activities, is a very wise thing to do for two or three weeks. If his color, energy, and good appetite do not seem to return, or if he doesn't regain his lost weight or appears listless and cranky and pale, have him checked by the doctor.

The greatest concern in relation to streptococcic infection is the possibility that rheumatic fever or nephritis may result.

Rheumatic fever and heart conditions are discussed in Chapter 44, "Some Diseases of the Circulatory System"

Nephritis is discussed in Chapter 47, "Some Diseases of the Urinary Tract"

Chorea (St. Vitus' dance) is a nervous manifestation of rheumatic disease, and the child with chorea should be under the doctor's care during the entire course of the illness The child is restless, irritable, and unstable, with erratic, continuous motion of different groups of muscles First the face twitches, then a hand flies out, and then the head jerks The child should be kept in bed in a darkened, extra quiet room and disturbed as little as possible Sedatives are frequently prescribed General care must be as brief and calm as possible A regular check of temperature should be made As the child gradually emerges from a severe attack, he requires a great deal of attention in order to keep him contented and quiet until the disease has completely run its course, which may be from six weeks to three months There is a tendency for chorea to return

## COMMON RASHES

Sometimes even the skin specialist has difficulty in diagnosing rashes in children It is safer to consult the physician as soon as a rash appears, to avoid serious results or the danger of spreading infection

Heat rash occurs in small infants and small children in hot weather It is a fine, raised, red rash, occasionally with tiny blisters usually seen first around the neck, back, and armpits Bathe frequently and powder liberally and remove all clothes except the diaper

Diaper rash has a red, blotchy, scaly, dry appearance in the diaper area, due to scalding by ammonia in wet diapers Boil the diapers, bathe the buttocks, and expose to fresh air frequently Coat liberally with cream or petroleum jelly after bath and exposure

Measles, German measles, chickenpox. See Chapter 54, "Some Communicable Diseases"

Eczema, hives, impetigo, ringworm, scabies. See Chapter 43, "Some Diseases of the Skin"

Worms The commonest variety in childhood are the pinworms They cause considerable itching and scratching around the anus and

buttocks. Take the child to the doctor's office. He will prescribe specific medicine for the individual child.

## ENTERTAINMENT

The child with a short acute illness needs very little entertainment and is much better left alone, except for necessary care, until he is recovering. Then a little sociability and some play suggestions will make the last few days in bed quite pleasant. However, the child with a long chronic illness such as rheumatic fever, nephritis, or tuberculosis requires a great deal of entertainment and a show of enthusiastic interest in him and his problems. The type of toys and creative material he may use will depend on the amount of exercise his doctor will allow. To make any form of bed rest pleasant to a child requires infinite patience and kindness, combined with gentle firmness and, above all, ingenuity.

Care of the child who is suddenly compelled to be flat in bed is a trial to him as well as to the adults associated with him. He has no definite feeling of being sick and it is difficult for him to understand the enforced quiet and bed rest. His mind is alert and must be kept occupied during his wakeful hours with amusements which will permit him to expend no more physical energy than the doctor has allowed. At first he may be absolutely flat in bed, being bathed and fed without sitting up. During this period the radio, record-player, television, and being read to are about all that he can enjoy. Then gradually he may sit up in bed for short periods and be permitted light play, such as cutting out paper or drawing. As more and more activity is allowed, one's ingenuity is taxed to keep him contented. Throughout his illness he should be left quietly alone as much as possible, to enjoy whatever activities he is permitted. You should be readily available to throw new enthusiasm into the situation when he begins to tire of one thing and wants something else. Boredom and loneliness may cause apathy and loss of appetite, as well as undesirable activity. These inhibit all progress toward getting well. A little genuine love and tenderness on the part of the nurse will produce miracles in the appetite and behavior and general upward progress of a child with a long-drawn-out illness. If you love him, then he has something to live for.

## *SUMMARY*

Since many sick children are too young to locate their pains and discomforts, they feel afraid and frustrated, and hence are difficult to reason with They look to those around them for relief The nurse can give them assurance in a matter of-fact way by her quiet, patient comments and explanations, and by her ingenuity in diverting their minds from disagreeable aspects of their illness

Certain *symptoms*, with which the nurse should be familiar, warn of approaching illness Some signs suggest that the child should be put to bed in the expectation that he will not be seriously ill, but a few *signs*, such as fever, vomiting, and diarrhea, may indicate a serious illness, the doctor should be called at once

In an acute illness the body is likely to become dehydrated and a knowledge of a few procedures to relieve dehydration, control the temperature, and alleviate pain is very useful

Every acute illness requires specific measures for relief The doctor will prescribe treatment and the nurse will carry it out with careful observation of her little patient's reactions

After a long illness or an infectious one, the child will be weak for some time His health and strength should be carefully rebuilt, lest with a lowered resistance he may have further complications

Since the child is normally active, his sudden inactivity is baffling He needs diversion suited to his physical and mental conditon, supplemented and based on a realization that he is being loved and understood

### Questions

1 Discuss some signs of illness in a child
2 How can unpleasant liquids be disguised?
3 How is the temperature of a child generally taken?
4 What is meant by dehydration?
5 Discuss the wisdom of having the child drink milk after vomiting
6 Define fever
7 What are some signs of approaching convulsions?
8 How serious is headache as a symptom in children?

9. With what is earache usually associated?
10. How is a sore throat recognized in a young child?
11. What would you do if a child developed a tight barking cough in the middle of the night?
12. What particular danger lies in not calling a doctor when a croupy child with a fever does not respond to the inhalation of moist, warm air?
13. To what may be attributed most pains in the legs of children?
14. What should you do if the child appears unusually drowsy following an injury to his head?
15. What should be the atmosphere pervading the room of a child ill with chorea (St. Vitus' dance)?
16. Why is it wise to have a doctor see a child who has a rash?
17. What should you do if you discover that a child has pinworms?

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# CARE OF THE WELL CHILD

## *BECOMING AT HOME WITH THE CHILD*

The practical nurse who helps a family with young children through a crisis has a wonderful opportunity to give the child a feeling of security in his disturbed world She can help him to understand the new problems confronting him and to make an honest adjustment to them, and she can give him the support and confidence that he would otherwise have lost in his parent's absence or preoccupation

The nurse should keep in mind that the child's insecurity in times of stress will probably be reflected in his relationship to her He may regress temporarily in development and return to thumb sucking, bed-wetting, or soiling His appetite and sleep habits may also be affected, to say nothing of his disposition The nurse should not be discouraged when such disturbances occur, they should be her cue to concentrate especially on helping the child to make a sound adjustment to new circumstances She should be cheerful and serene with the child, affectionate and unscolding, never wavering in her confidence that the child will stabilize himself once again in his world

The practical nurse must be willing to understand and accept the ways of the family in dealing with the child She may know of

more recent or more generally approved techniques, but it would be most unwise to substitute these for strong family relationships. She will be expected to put into practice what she has been taught wherever this knowledge is of absolutely vital importance to the health and well-being of the child; but even then she will make her innovation slowly and with tact.

## *PHYSICAL CARE OF THE CHILD*

The well child in troubled circumstances - and the advent of a new baby can spell trouble in a child's world --will benefit greatly by regular, conscientious attention to the needs of his body.

Food. A child needs to be well nourished, even though his emotional state may well interfere with his appetite and mealtime behavior. In preparing his meals the nurse will, of course, apply the basic rules of good nutrition. Many children, especially when upset emotionally, do not share our idea of the importance of a well-balanced diet. The following suggestions should be of help when the child balks at mealtimes.

The nurse should not betray any anxiety about what the child is eating. As one famous pediatrician has said, "Most commonly children have feeding problems because so many mothers are conscientious about trying to make them eat well." * Above all the nurse should not scold, bribe, or even urge; such tactics are guaranteed to make the child even more stubborn, and he may actually become nauseated if pressed too far. It is best not even to discuss food and eating with him, but, instead, to talk pleasantly and casually about other things that interest him, acting cheerfully unconcerned about what is on his plate and what he chooses to do about it.

In her effort to make mealtimes happy and friendly, and to present food as conveniently and attractively as possible, the nurse will find that bright plastic dishes, easily handled spoons, and a comfortable, secure eating place all contribute to the child's ease. A little imagination in food presentation, such as funny faces cut into an apple, or even grown-up touches, like carrot curls, will often do wonders in stimulating a balky appetite. These special features

* Spock, Benjamin: *The Pocket Book of Baby and Child Care.* Pocket Books, Inc., New York, 1946, p. 332.

should be offered casually and without fanfare, for the child should not be made the center of attraction.

The nurse should be prepared to make substitutions of one wholesome food for another. If the child refuses cereal habitually, he might enjoy a banana. If he wants dessert first, he should have it. However, the nurse should not make several substitutions in one meal, for she is not expected to put all the resources of a hotel menu

FIG. 46. Self-feeding should be encouraged The younger child is left-handed and wisely allowed to continue in her own natural left-handed manner. Age, 2 years (Courtesy of Medichrome–Clay-Adams, New York, and Benz, Gladys S.: *Pediatric Nursing*, C V. Mosby Company, St. Louis, 1948.)

at the child's command. Meals should be regular and should not be prolonged inordinately; 30 to 45 minutes should be ample. If the child is not eating at the end of this time, the plate should be taken away pleasantly and casually. If the child becomes hungry before the next meal, water or a serving of fruit juice will tide him over.

The young child should be allowed to feed himself as soon as he is able—usually between 12 and 18 months. Even though he may make a mess of his table and of himself, self-help will stimulate an interest in food at an age when appetite is likely to be waning. It is

well to keep the servings small and have the child eat all that is on his plate rather than to discourage him with a heavily laden plate. (See Chap. 41, "Infant and Child Feeding.")

Elimination. The establishment of a good pattern of regular elimination is essential to the well-being of the child. Again, however, overanxiety on the part of the guardian is likely to result in the child's being stubborn. The cheerful, confident approach is most certain to bring the desired results. The child approaching two years is fully able to cooperate successfully. He will probably make some sign of his readiness to eliminate, with which the nurse can comply. He may, however, be frightened by the toilet and its flushing noises; if so, the nurse should try to provide a secure low seat over a "potty" for him.

If he has an accident, he should not be punished. At about two years, this is probably simply an accident, which should be dealt with in a friendly, casual way. If the child is three or four, he may be soiling as a result of emotional disturbance, such as fear of a new situation or jealousy of a new baby. The nurse should never shame the older child who makes this mistake, but should direct her efforts toward understanding his problems and helping him to feel secure again.

If a child's movements are hard and painful, the doctor should be consulted immediately, since painful movements often lead to the vicious circle of retention and constipation.

Some children get too absorbed in play to want to urinate when they need to. It is well to take the child to the toilet at regular intervals of about two hours if he has been wetting during play. If one of his playmates accompanies him on the short trip he will be less loath to leave his activity. A child should not be scolded or shamed for failure to urinate in a strange place. If he becomes uncomfortably full, a hot bath will help. Most children between two and *three years will stay dry at night, but the child may be picked up to* urinate in the night if he is dry at 10:00 P.M. and can keep fairly dry during the day. If waking him involves much of a struggle, it may do more harm than good.

We should remember that a child trains himself to a large extent. He will not have control until he is ready for it. Although "training" may be more convenient than lack of training, in terms of cleanliness and regularity, for the person caring for the child, too forceful

attempts in this direction will probably retard, rather than hasten, the desired result

**Sleep.** The preschool child usually needs about twelve hours of sleep at night besides a nap of from one to two hours in the daytime Even though he may not sleep at this time, he should rest

Bedtime should be cheerful and definite The particular hour will vary with the family routine For instance, if the father returns from work later than the usual hour—5 30 to 6 00 o'clock—it will be more beneficial for the child to have some time with him than to have an early bedtime This adjustment should not change the total number of hours the child sleeps in a day Once the hour has been decided on in a particular family, every effort must be made to stick to it

The younger child responds more readily if he is taken to bed, not simply told that it is time to go A quiet story while he undresses, or just some friendly chatter about what he has been doing recently, will make the experience a pleasant one Stimulating games should be avoided at this time If the child has a bedtime ritual, taking pains to learn it is worth while The child should be allowed to take toys, bits of cloth, string, etc , to bed with him as these trifles provide needed companionship

If the child gets out of bed on a series of pretenses, it may be because he feels lonely Therefore it will do no good to become annoyed with him Instead, the nurse should take him back to bed promptly, give him an extra hug and a good tucking in If the problem persists, the nurse should see if more companionship cannot be provided, at least during the day If the child feels more secure with a dim light on and the door ajar, the nurse should comply with his wishes

## *SOCIAL AND EMOTIONAL WELL-BEING OF THE WELL CHILD*

The child's physical welfare depends to a considerable extent upon his emotional well-being and the security of his relationship with other people We have discussed how the nurse may help to ensure proper growth of the body, it is equally important that she nourish the spirit of the child

**Security.** Most child specialists agree that the fundamental spiritual or emotional need of the child is a feeling of security. He must be surrounded with deep-abiding and wise affection, of which he is always certain. His parents are the principal source of this love; the practical nurse should do nothing to usurp or impair the precious bond between them and their child.

Those caring for children must demonstrate their unwavering confidence in the child, at the same time being ready to meet situations as they exist, not as it might be desirable for them to be. There are many variables in a child's pattern of development, and those close to him must be ready to understand and appreciate the factors which can impede the steady progress of achievement.

As a newcomer to the child, the nurse will undoubtedly find problems beyond her immediate comprehension. Nevertheless, the following simple guides will help the nurse to foster the child's sense of security:

1. Always treat him gently, firmly, reasonably, and cheerfully.
2. Remember that he is very imitative. Demand nothing of him which you yourself do not exemplify.
3. Keep in mind his sensitivity to praise, blame, or ridicule. Never, never laugh at him or use sarcasm with him.
4. Make all requests in a positive way. Avoid the unnecessary arguments which are bound to follow the "wouldn't you like to" or "don't you want to" approach.
5. Have confidence in yourself. The child knows that he depends on you; he becomes fearful and confused when he senses uncertainty in those who are caring for him.

**Discipline** is closely related to security. The child feels lost and fearful when he does not know what his limitations are, what boundaries he must not overstep. Here are some suggestions on teaching these things to the young child:

1. The younger the child, the more you will have to rely on removing him physically from dangerous or forbidden situations. To keep him away, distract him with something interesting but harmless. Eventually, he will understand the meaning of *No*, although to be effective *No* will have to be accompanied by more distractions.
2. Avoid having always to say *No* by keeping temptation out of his way. Save *No* for those occasions on which it is really necessary.
3. Preserve your own rights when they are reasonable. The child

must learn how to get along with other human beings Assert yourself in a friendly way before you are tired or annoyed with him

When we think of discipline, we usually think of punishment Discipline is a continuing process of educating the child to live safely and sociably, punishment is a method of discipline which most child authorities have come to believe is seldom called for They say that a child does good things not because he fears the consequence of doing bad things, but because he wants to be loved and respected by other people The disapproval of an adult is often all the punishment a child needs The natural consequences of his act are often sufficient punishment, if he breaks a toy in anger, he will soon miss it and wish it were whole again Isolation will sometimes calm a child who is having a tantrum However, if isolation increases his rage, it serves little purpose Isolation in the child's own room is often frowned upon as a means of punishment, since it may detract from the friendly atmosphere of the room as a place to play and sleep in

In general, the practical nurse should refrain from all stronger forms of punishment If they are able to be used at all, they should be administered by the parent as infrequently as possible As a final word of warning, never threaten the child with the dire and morbid fates which befall "little children who can't behave"

**Cooperation.** The child is born a social being and as such he wants to help You can do a great deal to foster feelings both of sturdy independence and of belonging if you encourage his efforts to help himself and the household You can let him take over whatever dressing or undressing he can do for himself, but when he gets tangled up you can be ready to give him a little tactful help If his clothes fit easily and are designed sensibly, dressing will go more smoothly

The child will help you put away his things if you make a game of the activity, sometimes, to your surprise, he may do the job by himself Similarly, he will enjoy such household tasks as helping to dust, polish, or cook His efforts may be clumsy but we should never let the child feel that he is in the way or that he is more trouble than help Some day his muscles will coordinate more skillfully, in the meantime, he is learning that there is fun in work and, even more important, that there is real joy in helping others

Play. A child's play time is his work time; through play he comes to understand the world around him—not only its physical laws, but also some of its social customs. It develops muscles and their coordination as well as such abstract qualities as imagination, independence, and cooperation.

Some basic requirements for fruitful play are:

1. Adequate space which he can use with a minimum of *don't's* from grown-ups
2. Proper equipment for his stage of development; for example, for a toddler: boxes, stairs to climb, wagons to push and pull, blocks, or anything to develop his large muscles
3. Companions; after the age of two, the child should have playmates of his own age
4. Good supervision and direction

Although play does not necessarily imply outdoor activity, it is good for the child to have several hours out of doors in the sun each day. In the winter the hours around noon are best; in summer the child's head and skin may need protection during these hours. The skin should be exposed as much as possible to the sun for the maximum absorption of vitamin D.

Start summer exposure gradually to avoid burning.

In conclusion, although the opportunities for the practical nurse to foster the physical and spiritual well-being of children in the home are many and varied, she should never forget that the ultimate responsibility for the child rests with his parents.

## *TABLE OF DEVELOPMENT*

This brief chart will help you to have some idea of what to expect at different stages of growth. It was arrived at after an extensive study of normal well children. When such a table is used, one should keep in mind that even normal children differ greatly in rate of development. For instance, some children walk at eleven months; others, equally healthy, may not do so before the twentieth month.

One year

1. Stands alone; sometimes walks
2. Enjoys heavy activity: pushing, pulling large objects

3 Says one or two words, associating them with the objects to which they apply
4 Should be learning to feed self

Two years
1 Runs, climbs well (second story windows should be well guarded)
2 Enjoys finer activity pencil, stringing beads, etc
3 May have very definite food likes and dislikes, looks for elaborate bedtime ritual
4 Uses simple sentences
5 Bladder and bowel control well established during waking hours, asks to go to the toilet and usually prefers to be left there
6 Undresses self but may have tantrums over being dressed
7 Feeds self favorite foods, may need help with others, mealtime rituals should be respected
8 Apt to be very demanding and possessive, even dictatorial

Three years
1 Child very active, balance and movement become more adult in character
2 Capable of fine hand activity, such as pasting, and stringing beads
3 Likes to hear stories and nursery rhymes told over and over again
4 Talks in full sentences, listens and learns from adult conversation
5 Feeds self well but is not quite ready for the confusion of the family table
6 Likes to dress self
7 Bladder and bowel control well established, few accidents at night
8 Has a strong imaginative life, perhaps a make believe companion

Four years
1 Very active physically, ambitious to do new things, likes trapeze swinging
2 Very articulate, delights in new vocabulary and endless questioning
3 Prefers play with other children to solitary play, although he needs some time alone in the course of the day
4 Can dress self if his clothes are laid out for him

Five years
1 Uses body skillfully, can wash, dress, eat, go to the toilet well by himself

2. Tries to do all things he sees being done around him; can be given simple household chores and errands to perform

3. Enjoys friendships and activities outside of the home; works well with other children

## *SUMMARY*

The child in the home where there is serious sickness which requires the mother's attention, even if she herself is not the patient, feels a lack of security and often reverts to his baby ways. He needs someone to take her place, but he probably feels that there is no one like his mother. The nurse can help him over the rough spots in his daily routine by turning everything he does into a game.

She can adopt the same attitude toward the child that the family does, and she can give regular attention to his physical needs. When the child has lost his appetite, she will appear unconcerned and casual, talking about other things, instead of betraying anxiety. She will make going to bed easy, interesting, and comforting. She will show confidence in the child—and feel it in herself, for the child depends on her for security.

By knowing what a child of his age would normally be able to do for himself, she will have a good idea of what to expect from the child in her charge. She will understand that the right kind of discipline is agreeable to the child, and she will refrain from hasty or drastic punishment. When he wants to help, she finds a way for him to do so, for she knows that he seeks her approval and is eager to be considered a part of the family group.

### Questions

1. How may a child's habits be affected when there is sickness in the home?
2. Give several hints on how to induce a child to eat normally.
3. Discuss how the nurse can be of help in the child's elimination problems.
4. How much sleep does the preschool child need?
5. Describe putting the child to bed.

6 Why is it likely that a child will get out of bed during the early evening, giving one excuse after another?
7 What should be the attitude of the nurse about coming between the parent and child?
8 How can the nurse foster the child's sense of security?
9 Give a definition of discipline based on modern educational principles

# 41

# INFANT AND CHILD FEEDING

It has been said that "good nutrition is every child's birthright," * and that the normal, healthy infant and child will have a much better chance of remaining healthy "if he is consistently provided with a sufficient abundance of foods known to be essential to sturdy growth and development." *

It is our purpose here to familiarize the nurse with the dietary requirements of infants and children at their different age levels; to acquaint her with the types of foods that are generally considered most desirable from a nutritional standpoint and because of the child's ability to digest them; to let her know at what stage of the infant's and child's life various foods are introduced; and to point out some of the techniques of infant and child feeding, since method and manner of feeding are equal in importance to types of foods offered.

## *FOOD FOR FULL-TERM BABY FROM BIRTH TO SIX MONTHS*

Breast milk is not only the natural but the ideal food for the infant during the first few months of life (usually the first six

* Senn, Milton J., and Newill, Phyllis K.: *All about Feeding Children*, Doubleday & Co., Inc., New York, 1945, p. 1.

months) It requires no preparation, is more readily available at the proper temperature, is free from contaminating bacteria, and is more economical than other feedings However, there are factors which influence the mother's ability to breast-feed her infant

Some mothers are not good milk producers, some mothers' health is such that it might be detrimental to nurse the infant, sometimes the financial status of the family makes it necessary for the mother to seek gainful employment outside the home, thus interfering with her possible desire to nurse her baby, and there are some mothers who just don t like nursing their babies—the idea goes against the grain Under such circumstances then, artificial feedings are prescribed

## ARTIFICIAL FEEDINGS

The physician determines the formula best suited to the individual baby and makes the necessary changes from time to time as indicated by the baby s growth and nutritional needs

The kind of milk, the method of preparing the formula, the method of handling it after preparation, and the care of bottles and utensils are all important details to be considered

Kinds of milk The grading and pasteurization of milk are explained in Chapter 20, "Food Lessons"

CERTIFIED MILK is the finest grade of milk available and to be thus designated has had to meet special demands of the state health department

HOMOGENIZED MILK is the milk in which the fat droplets have been equally distributed It may be used for infants who digest fat poorly However, it is not necessary for most infants

EVAPORATED MILK is canned milk from which a little more than half of the water content has been removed It is frequently ordered by the physician and is as satisfactory as fresh milk

SKIMMED MILK is milk from which the top cream has been removed It is sometimes used temporarily in diarrhea

POWDERED MILK is milk from which practically all of the fluid has been removed It may be made from whole milk, skimmed milk, partly skimmed milk, and from sweet and sour milk Be sure to check the label on the can to see that you are receiving the kind you wish

to use. This milk will keep without refrigeration until the container is opened. Powdered milk is more expensive than fresh or evaporated milk and is probably most advantageous or desirable to use when traveling with a baby.

LACTIC ACID MILK is a sour milk which is more easily digested by some babies than whole sweet milk. It can be made in a commercial dairy and purchased as "lactic acid milk" or it can be prepared in the home or hospital by adding the chemical solution, lactic acid, to boiled milk. The boiled milk must be cold before the lactic acid is added or the milk is likely to form large curds that will not pass through the holes in the nipple.

PREPARED MILK SUBSTITUTES are sometimes ordered by the physician when a baby is allergic to the protein of whole milk.

Importance of boiling milk. Boiling milk for the bottle-fed baby is a necessary and important safety measure, since it kills any disease germs that the milk may contain. It also makes the milk more digestible. After boiling, the formula must be kept in the refrigerator.

*Method of boiling milk:* The milk is boiled in a saucepan or double boiler and should be watched during the process to prevent it from scorching or boiling over. The physician usually orders the milk boiled from three to five minutes after it has begun to bubble.

Kinds of sugar used in artificial feedings. The doctor will prescribe the sugar that he thinks best for the baby. The kinds most commonly used are:

1. *Ordinary granulated sugar* (cane sugar), which is most commonly used because it is inexpensive.

2. *Brown sugar*, another inexpensive and readily available sugar upon which most infants thrive. It has a slightly higher mineral content than white sugar, but it is also somewhat more laxative and therefore inadvisable to use for a baby with a tendency to loose bowel movements.

3. *Corn sirup* is a dark-colored sirup considered preferable to the light-colored, since the dark-colored is likely to contain more minerals, especially iron. It is inexpensive and is usually given to infants who show a tendency to form a lot of gas. However, it can also be used for infants who have no digestive disturbances.

4. *Proprietary or patent sugars for infants* are usually in powdered

form and are more expensive than corn sirup or cane sugar They should be added to the milk only as directed by the doctor

## PRELIMINARIES TO PREPARE THE FORMULA

Everything that enters the baby's mouth or comes in contact with the milk must be sterile Everything used in the preparation of the formula must be boiled in order to be sure that no bacteria are present After boiling great care must be taken in handling the articles *so as not to contaminate* them Not until the baby is at least a year old will he have had time to build up his natural immunity to a point where he will no longer require this extra protection against germs

New bottles and nipples require the same careful attention to washing and boiling as do bottles and nipples which have already been in use

**Types of bottles and nipples.** Any type of nursing bottle whose complete surface can be reached easily with a bottle brush is considered satisfactory, and any nipple which can be turned inside out, scrubbed, and boiled is considered suitable

**Care of nipples** The hole in the nipple should be just large enough to allow the milk to fall in rapid drops when the bottle is held upside down A stream indicates too large a hole If the bottle has to be shaken to get the milk out, the hole is too small When the hole in the nipple is too large, the baby will drink too rapidly and get indigestion Too small a hole will also give trouble, as the baby will take too long to get nourishment and frequently will swallow air, which gives him colic It is better to buy nipples without holes and puncture them yourself with a No 10 needle

Insert the eye end of a No 10 needle into the small end of a cork Hold over a flame until needle becomes red hot, then puncture the nipple When the hole becomes too large from use, discard the nipple

After using, the nipples should be rinsed in cold water and kept in a glass jar until the next formula is prepared

There are various types of nipples on the market which are made to fit special feeding bottles They are put on at the time of preparing the formula and adjusted at feeding time These special nipples and bottles are expensive, but reduce the amount of handling

## Preparation of the formula: Aseptic method

### *Equipment*

- Bottle sterilizer or large covered kettle and rack for bottles
- Feeding bottles (seamless and easily cleaned); have as many bottles as there are feedings in 24 hours and a few extra ones for water, orange juice, and to allow for breakage
- Nipples, 24-hour supply
- Glass nipple covers
- Forceps, 7-in.
- Tongs or long-handled spoon
- 1 glass jar with cover for extra boiled nipples
- 1 glass jar for used nipples
- Bottle brush
- 16-oz enamel graduate
- Can opener or ice pick
- 2 teaspoons
- 1 tablespoon
- Saucepan for boiling nipples
- Fine strainer
- Teakettle for boiling water
- Funnel, glass or enamel
- Saucepan or double boiler for boiling milk
- 1 table knife
- 1 or 2 clean towels for picking up tongs or long-handled spoon after they have been boiled

*Procedure.* Thoroughly wash the top of the table you will be using for making up the formulas. Put *written copy* of formula in plain sight and have a clock or watch available for accurate timing of the cooking process.

Fill the kettle or saucepan with water and boil for 10 minutes.

Put milk on to boil. If evaporated milk is to be used, scrub the top of the can with soap and water and rinse with hot water before opening can.

Wash hands thoroughly and clean fingernails.

Scrub bottles, nipples, and nipple covers inside and out with hot soapy water, using bottle brush. Rinse thoroughly. Make sure no loose bristles are left clinging to the bottles.

Put nipples into a covered saucepan and boil for five minutes. Pour off water and leave the nipples in the covered saucepan until after the formula has been poured into the feeding bottles. Extra nipples for emergencies may be put in a sterilized glass jar with a sterilized spoon which is used to remove the nipples. Since the nipples must be kept dry, do not allow any water to get into the jar.

Stack bottles upside down in the bottle rack.

Put about 2 in. of hot water in the kettle or bottle sterilizer; then place the full bottle rack in the sterilizing container. Now fit in the

nipple covers and all utensils used in preparing the formula (*Note* If a bottle sterilizer is used, a kettle may be necessary also, to hold the larger utensils )

After putting the cover on the sterilizer, vigorously boil the contents for at least 5 minutes While the equipment is boiling, put a clean towel over the area on the table where you will be making up the formula

When boiling of the equipment is completed, put the sterilizer on or near the table where you will be working Remove cover from sterilizer Wait for it to cool enough so that you can pick up the tongs or long handled spoon without burning yourself (You may use one of the clean towels, folded, to remove these utensils ) Be careful not to touch any of the other articles in the sterilizer Using the tongs or the long handled spoon, pick up the remaining articles from the sterilizer and place on the clean towel which has been spread on the table

Lift the rack of bottles out of the kettle, let drain for a couple of minutes, then place the rack with bottles on the towel covered part of the table

Measure the required amount of boiled water into the sterilized measuring cup and pour it in the sterilized pitcher or quart jar

Measure the required amount of sirup or sugar into the measuring spoon and add to the water in the pitcher (All measures are level, thus, if using dry sugar, level off the measuring spoon with a table knife ) Stir until dissolved

Place sterilized strainer on top of pitcher

Measure required amount of boiled milk into the measuring cup and pour through strainer into pitcher Stir the milk, sugar, and water with the long handled spoon (*Note* if evaporated milk is to be used, puncture two holes in top of can, which already has been scrubbed thoroughly Measure required amount of milk into the measuring cup Pour milk into water-and-sugar mixture—strainer not necessary—and stir with the long handled spoon )

Using the funnel, fill feeding bottles to the required amount

Put nipples on bottles and cover with glass or aluminum nipple covers

Put separate bottles, or rack containing bottles, in the refrigerator

Wash all utensils and put away in readiness for the next day. The equipment used for the infant should be kept for him alone.

**Terminal sterilization method**

*Equipment*

- Pitcher or quart jar
- Feeding bottles and nipples
- Nipple covers—glass or aluminum
- Measuring cup—8 oz
- Measuring spoons
- Can opener or ice pick
- Long-handled spoon for stirring formula
- Funnel—enamel or aluminum
- Bottle brush
- Table knife
- Sterilizer and bottle rack, or pail with wire mesh or washcloth in the bottom

*Procedure.* Wash bottles and nipples and prepare self and working area as for the aseptic method.

Measure the required amount of tap water into the measuring cup and pour into pitcher or quart jar.

Measure required amount of sirup or sugar into measuring spoon and add to water in pitcher. (All measures are level; thus if using sugar, level off measuring spoon with table knife.) Stir until dissolved.

Measure required amount of milk into measuring cup. (If evaporated milk is used, scrub top of can with soapy water and rinse with hot tap water. Open can by punching two holes in the top). Pour milk into water-sugar mixture and stir with long-handled spoon.

Using funnel, pour the formula into the feeding bottles.

Put the nipples on the bottles.

Place the nipple covers over the nipples. Apply covers loosely to allow the steam to circulate.

Place rack, or wire mesh or washcloth, in bottom of sterilizer. Stand the bottles of formula on it, and then pour in 2 in. of water. Cover the sterilizer with lid and place on stove. When the water starts to boil, write down the time and *boil for 25 minutes by the clock.*

Take the sterilizer from the stove, remove bottles, and let them cool for 20 minutes. Then press nipple covers down firmly over the nipples.

Stand bottles in pan of cold water for 10 minutes, changing

water in pan as necessary to keep it cold The water should come up to the level of milk in the bottles

Place covered bottles in refrigerator until needed

## TO GIVE FEEDING

Take feeding bottle from icebox Shake it to mix the cream, and warm it by placing the bottle in a saucepan full of cold water Heat it to 105°F (40 5°C ), letting the bottle stand in the water a few minutes If you have used the aseptic method of sterilization, wash your hands, then remove a fresh nipple from the jar with the spoon which is in the jar Put the nipple on the feeding bottle, taking care to touch only the rim of the nipple

Most babies like their formula at just about body heat The best way to test the temperature is to shake a few drops on the inside of your wrist It should feel warm but not hot

The bottle must always be held while giving the feeding, and the neck of the bottle is kept full so that the baby will not suck in air Hold the baby in your lap in a partly upright position Allow 20 minutes for feeding Frequent "bubbling" during and after the feeding will ensure the infant's retaining his feeding "Bubbling" may be accomplished by holding the baby over your shoulder and gently patting his back

The baby's feedings should be uninterrupted and he should not be played with during this time After the feeding is completed place him in his crib, either on his abdomen or on his right side, propped with a folded blanket

As soon as the baby has finished, discard any milk left in the bottle, as such milk should never be used again Rinse the bottle at once in cold water, fill it with cold water, and let it stand in a special place until the next morning The nipple should be turned inside out, rinsed, and put in the jar kept for used nipples Never use a nipple for a second feeding without washing and reboiling it

Demand feeding Many physicians and parents believe that the baby should be fed whenever he is hungry, instead of being awakened to be fed at regular intervals With some babies this plan works out very well, they soon regulate their own feedings When the mother's milk begins to flow, the baby may require from 6 to 10

feedings in 24 hours; but as soon as the flow is established he becomes more satisfied and wakes less frequently until he finally arrives at the point when he is averaging about four hours between feedings.

The important thing to bear in mind about the feeding schedule is that it should be flexible enough to adjust to the baby's needs and happiness.

Amount of feeding. The amount to give the baby at a feeding varies with his size and age. If he doesn't seem to want all that is in the bottle, let him stop when he wants to.

Drinking water. While the formula is being prepared, the boiled water for the baby to drink between feedings can be poured into the feeding bottles, the nipples adjusted, and the glass covers put on.

## SUPPLEMENTS TO THE BREAST MILK OR BOTTLE FEEDING

Although milk is considered a relatively "complete" food, there are certain elements it does not contain in the quantities recognized as being requisite for maintaining optimum health. Therefore certain vitamin supplements have to be added at a very early period in the infant's life.

VITAMIN C should be added to the diet, beginning at two or three weeks of age. Orange juice or tomato juice are the accepted sources of vitamin C and should be given daily, according to the physician's orders.

Tomato juice, strained, may be used as a substitute. Twice as much tomato juice as orange juice is necessary to provide an equal amount of vitamin C.

VITAMIN D should be given from the second and third week. Fish oil is a good source for vitamin D. The dosage varies with the preparation used. It should be continued during the period of growth except when there is adequate exposure to the sun.

VITAMIN A is usually adequately supplied by the foods given. Fish oil contains vitamin A. It is also present in cream, egg yolks, and green vegetables.

WATER should be offered between meals, two or three times a day in winter and three or four times a day in summer. The water should always be boiled and cooled. The child will often refuse

water, but it should be offered until the habit of taking it is acquired

Introduction to solid foods. Some general principles are

1 Start only one new food at a time
2 Start all new foods in small amounts
3 Introduce a new food at the beginning of a meal, when the child is hungriest, to take advantage of his appetite
4 Avoid introducing new foods at a time when the child is physically or emotionally disturbed in any way, for example, during illness or if there is a new baby in the family

CEREALS may be added by the third or fourth month Start with a white cereal since it is easier to digest than a whole-grain cereal Start the baby off on a teaspoonful or less and gradually increase the amount until one to three tablespoonfuls twice a day are being received by the time he arrives at the age of five or six months Cereal is usually given with the 10 00 A M feeding and then, later, with the 6 00 P M feeding

VEGETABLES are usually added soon after cereals They should be strained by rubbing through a fine wire sieve Cans of strained vegetables or fresh, home-cooked vegetables which you strain yourself are equally good Start with one teaspoonful or less, gradually increase until about two to four tablespoonfuls twice a day are being received by the time he is from five to seven months old Vegetables are usually given at the 2 00 P M feeding

The baby may have spinach, carrots, green peas, fresh green lima beans, chard, young beet greens, fresh asparagus, and cooked lettuce

EGG YOLK may be started anywhere between two and five months It may be either hard-boiled, mixed with vegetables, or added raw to one bottle if the baby is taking a formula Whole egg is usually not given until the baby is a year old

FRUITS may be given between three and six months They should be properly cooked and strained Start with 1 teaspoon at the 2 00 P M feeding and gradually increase until the infant is receiving 2 or 3 tablespoonfuls daily, either all at once or at two different meals

MEAT, FISH, AND POULTRY The time for the introduction of these foods varies considerably—anywhere from four months of age to one year, dependent upon the physician's orders

Soups containing strained liver and vegetables may be started at three months—usually with the 2:00 P.M. feeding.

Schedule of feeding baby until six months old

| FOUR-HOUR FEEDING INTERVAL | | |
|---|---|---|
| A.M. | 6:00 | *Early morning nursing* |
| | 9:30 | Fruit juice and fish oil |
| | 10:00 | Midmorning nursing |
| P.M. | 2:00 | Midday nursing |
| | | Water boiled and cooled, offer 1 to 3 oz |
| | 6:00 | Bedtime nursing |
| | 10:00 | Night nursing (if still required) |

## *FEEDING THE CHILD FROM SIX MONTHS TO TEN YEARS*

### FOOD FOR BABY FROM SIX MONTHS TO TWO YEARS

The food given to a baby after six months of age varies widely according to the demands of the baby and the practice of the physician who is supervising the feeding. The food already recommended contains all the essential elements. Further additions consist of modifications of consistency, sources of food, and methods of preparation. The chewing reflex gradually replaces the sucking reflex. This is a natural transition as the teeth erupt, provided the opportunity for its development is given. There is also the desirability of offering food with variation in taste.

The food will be increased gradually to include the following:

1. Milk, a pint and a half to a quart
2. Cereals
3. Fruit juices and well-cooked strained fruits, as apples, prunes, apricots, and peaches, either fresh or canned; raw scraped apple and thoroughly ripe, raw, mashed banana
4. Vegetables, canned or fresh, well cooked and strained at first, then chopped or mashed as soon as the child learns to chew and swallow larger particles—usually around from 8 to 10 months of age. Potatoes may also be given, but they should not be used as a substitute for other vegetables. Potatoes should be either boiled or baked, then mashed. A satisfactory way to use vegetables in a child's meal is to combine two or three in soup.

5 Eggs, one a day

6 Meat, fish and poultry Meat broth is a good medium for giving vegetable or for giving more water Meat should be finely minced the first year

7 Simple desserts—Junket, Jell O, custard—may be started at 6 to 7 months Do not give if child's appetite is poor, since he may lose his appetite for the more essential foods

8 Bread and butter

Suggested menu for the eighteen-month-old baby

| | | |
|---|---|---|
| A M | 7 00–8 00 | Fruit juice<br>4–6 tablespoons cereal<br>Egg and/or bacon |
| NOON | 11 00–1 00 | Egg or meat<br>Potatoes, rice, spaghetti, noodles, hominy, barley, or macaroni<br>Vegetable<br>Cooked fruit or simple dessert<br>Milk |
| P M | 4 00–6 00 | Cereal or milk toast or cream toast or cream soup<br>Milk<br>1 slice bread and butter and graham crackers<br>Simple dessert or fruit |

The baby may have milk on waking from his nap

## FOOD FROM TWO TO SIX YEARS

From two to six years the meals consist principally of the same kinds of foods, but the combinations are more complex, the variety is wider, and the amounts are larger

*Milk still heads the list of foods needed, but at least* two glasses should be taken as a beverage

Left to his own devices, a child will choose an adequate diet and select it properly, if he is forced to eat certain foods, it is often the beginning of feeding problems which are hard to overcome

Suggested menu for the two- to six-year-old

| | |
|---|---|
| BREAKFAST | Citrus fruit or juice, or tomato juice<br>Cereal<br>Egg<br>Bread with butter or fortified margarine<br>Milk |

| | |
|---|---|
| DINNER | Meat, poultry, or fish |
| | Potato |
| | One or two green, yellow, or leafy vegetables |
| | *or* |
| | One such vegetable and a salad |
| | Bread with butter or fortified margarine |
| | Fruit or dessert |
| | Milk |
| SUPPER | Cereal, macaroni, potato, or soup |
| | Cooked vegetable or salad |
| | Bread with butter or fortified margarine |
| | Fruit or dessert |
| | Milk |

## FOOD FROM SIX TO TEN YEARS

The school child 6 to 10 years of age needs a wide variety of foods, but only easily digested foods should be chosen. Three meals a day are usually sufficient. Sometimes a light lunch consisting of an apple or orange or a glass of milk or fruit juice is desirable in the middle of the morning or afternoon. The heavy meal may still come in the middle of the day. Usually dinner is given in the evening, as it is ideal for the youngster to eat with the family and be made to feel a part of the group.

Meat once a day and one egg a day, with one quart of milk, will furnish sufficient protein food for growth.

The child should not be allowed to eat indiscriminately between meals, for this habit spoils his appetite for foods really needed.

At this age, more than at any other, we have the candy problem. Teach the child to keep his candy to be eaten after meals. This will save some digestive upsets and lack of appetite.

Menu for the nine-year-old

| | |
|---|---|
| BREAKFAST | Fruit |
| | Cereal |
| | Eggs |
| | Toast |
| | Milk |
| A.M. 10:00 | Milk |
| DINNER | Fish or meat |
| | Potato |
| | Cooked vegetable |
| | Raw vegetable |
| | Bread and butter |
| | Simple dessert |
| P.M. 3:00 | Fruit or milk |
| SUPPER | Simple hot dish |
| | Sandwich |
| | Fruit or salad |
| | Simple dessert |

## *SUMMARY*

Although a child's nutritional requirements vary with his age and other factors, every child needs good nutrition and should have the benefit of approved techniques as applied to feeding

Breast feeding is both natural and ideal, yet under some circumstances it is better for the physician to prescribe a formula, and to modify it from time to time as indicated by the baby's needs

The formula will contain one or more of a number of types of milk and sugar Its preparation is based on aseptic methods

The baby may be fed on schedule or on "demand," but in either instance, he is soon feeding regularly The amount of food given varies The formula is supplemented by orange or tomato juice and fish oils to provide vitamins not found in adequate quantities in milk and sugars as combined in the formula

Solid foods are introduced gradually, under the direction of the physician They include cereals, vegetables, egg yolk, fruit, and meat or its equivalents

By setting up certain age groups, general principles for each group may be formulated, and the approximate amounts of specific foods, together with suitable methods of preparation, may be set forth

The general aim is to provide adequate amounts of all essential foods on a basis flexible enough to yield variety and to cover personal tastes

### Questions

1 What are some of the advantages of breast feeding?
2 Why do not all mothers nurse their newborn babies?
3 Name and discuss several forms or types of milk
4 Name four kinds of sugar used in artificial feedings
5 What is the general purpose of the preliminaries to the baby's feeding?
6 What is meant by the "terminal sterilization" method?
7 At what temperature should the feeding be given to the baby?
8 Discuss "demand feeding"

9. How is water prepared for the infant to drink?
10. Of what vitamin is orange juice a rich source?
11. What two vitamins does fish oil contain?
12. What foods suitable for young children are good sources of vitamin A?

# 42

# POSTNATAL CARE

Postnatal care is the care of the mother after she gives birth It is the period from the end of labor until the genital organs and tract have returned to normal size and condition (from 6 to 12 weeks) It is also the period during which the breasts are developing and secreting milk for the nourishment of the baby

Every effort should be made to encourage rest, for immediately after labor the patient experiences a sense of exhaustion, followed normally by a feeling of relief This is usually followed by a sound and natural sleep, but some mothers may experience afterpains and find it difficult to relax without some supportive help

## *CARE OF THE MOTHER*

The uterus is watched for several days after delivery to be sure it contracts well and that the tone of the muscle is good For many days the uterus is still large and can easily be felt by placing the hand on the abdomen

After a Caesarean section an abdominal binder may be applied The binder is made of a double thickness of strong unbleached cloth, 18 in wide and 45 in long, firmly pinned in front with large safety pins placed crosswise, 1 in apart It is applied after the bath and is usually discontinued after 48 hours or sooner if the patient finds it uncomfortable

*To put on an abdominal binder.* Begin pinning at the top and, after the pins are all in, take up a pleat on each side with small safety pins following the curves of the body.

Lochia. There is flowing after delivery, the amount decreasing day by day until, in normal cases, it has ceased in the third week. The discharge is called lochia and is somewhat like normal menses, though frequently clots are present. The flowing should be watched and any excessive amount or foul odor reported to the physician.

## CARE OF THE GENITALS

After the nurse's hands have been washed thoroughly, the patient's vulva and perineum are washed with the solution ordered by the doctor and a sterile pad is applied.

The perineum is the tissue between the vagina and the rectum. It usually is incised during delivery. The incision has to be sewed up, and the stitches usually cause some discomfort. Aseptic care of this incision is very important and is usually carried out by the professional nurse or by the practical nurse under her supervision for the first 24 hours or while the patient is in bed.

Aseptic perineal care

*Equipment*

Tray or cart
Paper bag
Covered pan containing sterile forceps
Covered sterile pitcher with warm water or antiseptic solution
Can or container of sterile cotton pledgets
Can or container of 4-in. sterile squares
Can or container of sterile pads
Transfer forceps in container of antiseptic
Uncovered pan to receive used forceps
Bedpan

*Procedure in hospital.* Screen patient and put in position on bedpan in usual manner. Unfasten sanitary belt or T binder.

After putting patient on bedpan, remove soiled pad and discard in paper bag. Never allow patient to take off soiled pad or adjust fresh pad while she is a bed patient.

Wash hands thoroughly. Return to bedside.

Uncover can of sterile squares; hold cover in left hand.

With transfer forceps, remove one of the squares Replace cover and place square on overbed table or other suitable place Holding cover in left hand, uncover pad can and, with transfer forceps, remove one or two pads as required and place on sterile square Replace cover on can

Remove cover on cotton-pledget can with left hand and, with transfer forceps, place five or six pledgets on sterile square Replace cover on can

Uncover pan containing sterile forceps Holding cover in one hand, remove one pair of forceps with transfer forceps Place sterile forceps on sterile square and replace cover on pan

Now fold back bedclothing over patient's knees

Draw back sterile towel covering solution pitcher and pour solution over the vulva

Pick up forceps from sterile square and with forceps take up one cotton pledget With *firm but gentle stroke*, wipe down farther side of perineum with one wipe only Discard pledget

Repeat procedure on nearer side of perineum with second cotton pledget

Repeat procedure on center of perineum with third cotton pledget If there are stitches, use gentle but firm strokes

Use more pledgets if necessary and clean patient Be sure to leave perfectly dry

Place pad in position with forceps A second pad may be necessary if patient has had much lochia

Remove bedpan and cover it, place bedpan on chair Instruct patient to turn on side away from you

Take one pledget with transfer forceps, cleanse rectal area and buttocks, always wiping away from vaginal area Repeat this cleansing procedure until patient is thoroughly clean and dry

Apply T binder or fasten pad to sanitary belt Have patient turn on back and fasten binder

Replace bedclothing over patient and remove screen

Carry bedpan to utility room, examine contents, check order book for any directions before emptying pan Check pad so as to describe lochia in nurse's notes It is usually recorded as profuse, moderate, scant, or normal

**Self-perineal care.** In the hospital aseptic perineal care is given by the nurse every four hours for the first day or two following

delivery. Usually after the second day the patient is taught "self-perineal" care (unless there is infection).

The purpose of self-perineal care is twofold:

1. To teach personal hygiene to the mother
2. To prevent infection

*Equipment*

Cotton bag containing individually wrapped pads
Perineal pads with cotton balls
Antiseptic solution

*Procedure.* Take the patient to the bathroom. Show her where the perineal pads are kept and direct her to wash her hands. Have the patient unfasten the pad, instructing her to remove it from front to back, and place the pad in the sanitary can provided. After voiding or defecating, the patient cleanses herself from front to back with cotton balls saturated with antiseptic solution or water, using a fresh cotton ball for each stroke, and discarding it in the sanitary can.

Demonstrate the method of opening the pad without contaminating the inner surface. Instruct the patient to apply the perineal pad to the perineum, putting it on from front to back. Pin it in front and then in back. Wash and dry hands.

Physicians usually have special instructions which they wish carried out, and public health organizations have developed routines which are used as guides in teaching the proper procedure to the patient's family.

*In venereal diseases* (when a gonococcic or syphilitic infection is present) care must be taken to avoid contracting the infection or carrying it to other patients. The nurse should wear a gown and rubber gloves. She should be extremely careful to avoid getting infectious material in her eyes. Goggles are a safeguard. The patient should be cautioned against touching the perineal area to prevent carrying infection into her eyes. Utensils are sterilized by boiling for 20 minutes immediately after using. The hands must be washed thoroughly at once under running water.

## CARE OF THE BREASTS

At the time of her bath, the patient will wash her breasts with a washcloth and warm soapy water. She will dry the area carefully with a clean towel and put on a firm brassiere.

Sometimes a breast binder is ordered instead of the brassiere It may be made of strong unbleached cloth or bird's eye cotton A dressing towel, folded in thirds, may be used It is pinned firmly in front with large safety pins placed an inch apart Like the abdominal band, the breast binder is applied after the bath

*To put on a breast binder* Begin pinning in the middle and pin down, then up Take in a pleat on each side with small safety pins, following the curves of the body The breast binder will remain in place if shoulder straps made of bandage are pinned on in back and in front Use several folds of bandage in order not to cut the patient's shoulders

The baby is put to the breast 12 hours after birth unless other directions are given by the physician There is practically no milk present so soon, but the act of nursing is beneficial to the breasts and stimulates the secretion of milk

Congested breasts Sometimes the breasts swell up and become sore This may mean that a breast abscess is beginning, or it may mean congestion, that is, the backing up of milk in the ducts The attention of the doctor should always be drawn to any breast soreness Never massage a sore breast

Care of the nipples The nipples of the nursing mother are cleansed before each feeding with sterile water or the antiseptic solution used by the hospital

*Equipment*

Tray or plate
Sterile water or antiseptic solution in covered jar
Sterile absorbent cotton in covered jar
Paper bag
Squares of sterile gauze

*Procedure* Unfasten brassiere or binder if worn

Remove cover from jars, be careful when putting them down not to contaminate the inside

Scrub your hands and do not dry

Take a piece of absorbent cotton from jar, be careful not to touch the part which will be used to clean the breast Dip in the sterile water and wipe the nipple Discard and take a fresh piece of absorbent cotton for the other nipple Do not dry the nipples After the nursing is finished, the nipples are again cleansed in the same

manner as above. A fresh piece of sterile gauze is applied to each nipple.

Cracked nipples. Sometimes the nipples crack and bleed. This is very serious for, unless proper care is given, a breast abscess is likely to develop. The baby should not be nursed on a cracked nipple. It is very painful for the mother, and germs may enter through the cracked surface. This condition should be reported to the physician, who may order the use of a nipple shield or breast pump. The shield or pump must be boiled each time before using, and must be rinsed in cold water and scrubbed clean after using.

The baby sucks the milk through the shield, which fits over the area around the mother's nipple. Or, if the breast pump is used, the milk is drawn out by working a rubber bulb by hand, or by an electric pump.

No ointment or other medication should be applied to a breast unless ordered by a physician.

Diet. For the first two weeks after delivery, the patient should have plenty of simple nourishing food.

Care of the bowels. It is important that the bowels should be moved regularly either by mineral oil or milk of magnesia, or by an enema as ordered by the physician. After the first few days, the bowels can usually be regulated by diet.

Urination. Often, after delivery, the patient cannot void; this should be reported to the physician before eight hours elapse.

Length of stay in bed. Some patients are allowed up the day following the birth of a baby, and most patients are not confined in bed longer than 48 hours. This is for the theoretical purpose of lessening the chance of phlebitis, and the patients are encouraged to move about and exercise their arms, legs, and abdominal muscles. A generous hospital stay would be eight days. Many hospitals discharge obstetrical patients in three to five days. Thus, home care will depend on the number of postpartum days that have elapsed.

Care of the mother in the home. One of the most important opportunities the practical nurse has to give of a really lasting service is in the care of the postnatal patient and her baby, from the time the patient leaves the hospital until she is strong enough to care for the baby herself. The nurse should remember that the mother is

still in the convalescent stage and needs a definite amount of care She should be guarded from worry, overexertion, and excitement She should have her breakfast in bed, and her day should begin at ten o'clock, with a long rest in the afternoon and an early bedtime If there are young children in the family, try to keep them as quiet as possible when the mother is resting or nursing the baby

The patient's personal hygiene and sense of well being and clean liness should be encouraged It would be unusual for the patient to be prevented, by her physician, *from caring for herself* She usually can go to the bathroom, where perineal care will consist of washing the hands carefully, then washing the perineal area with ordinary toilet tissue or perhaps sterile cotton balls, as previously described, using water instead of an aseptic solution After the patient is physically able, there will be no contraindication to a sitz bath or a shower Certainly by two weeks postpartum the patient may take a cleansing tub bath Many doctors allow this bath even earlier

If the physician has ordered a daily douche, the nurse should prepare everything for the patient and show her how to take the douche as she lies on her back in the bathtub It is important that the bowels should be emptied at least once every other day The nurse should watch the patient and tactfully advise her not to be engulfed in household duties, and to sleep between feedings as does her newborn baby Besides this, the nurse should gradually teach the patient how to take care of the baby so that when the nurse leaves the mother will feel perfectly competent to carry on by herself

*Importance of breast feeding* Since the baby's health is safeguarded by his mother's milk, every effort should be made to maintain the milk supply

Some women never have enough milk, their breasts may lack sufficient glands and ducts to produce an adequate amount of milk for a hungry baby In others, the supply gives out in two or three weeks But almost every healthy woman can nurse her baby if she is so inclined and willing to order her life to that end Moderate exercise, outdoor air, sunshine, sufficient sleep, and some recreation are all necessary Excitement, nervous strain, and hard work should be avoided The nursing mother may eat whatever agrees with her if it does not upset the baby, but she should be sure that her food is

nourishing and well cooked. Many obstetricians and pediatricians feel that chocolate and cocoa tend, in the nursing mother, to give the baby loose stools; thus the mother may not know whether this is serious diarrhea or not.

The daily diet should include green vegetables, fruit, whole-grain cereals or breads, ½ lb of meat, and a quart of milk, which may be in the form of cooked food or taken as a beverage. One quart of water should be taken during each 24-hour period. Alcoholic liquor does not increase the flow of milk.

The usual practice with normal full-term babies is to put the baby to breast every three to four hours regularly. When the mother is up and about, she should sit in a low, comfortable chair when nursing the baby and hold him in a reclining position with his head resting on her arm. If she lies down while nursing, she will get that much more rest during the day. She must always be careful not to let the baby's nose press against her breast, as it will interfere with his breathing.

The feeding usually takes no longer than 20 minutes. The breast must be emptied at each feeding in order to stimulate the milk supply. One breast is usually sufficient, and the baby should be put to the alternate breast the next time. However, if the baby is still awake and hungry, offer the baby up to 10 minutes on the second breast. The baby should be held on the shoulder to help him expel any air before he starts to nurse, halfway through, and at the end of the nursing. If it is necessary to find out the amount of milk taken, weigh the baby before and after feeding. Lay him in the scales fully dressed. The mother and baby should be alone and undisturbed during the feeding.

The practical nurse should be alert and observant at all times to detect any change in the condition of the mother or baby. The best safeguard is to take the temperature daily and each should have a separate thermometer. The mother's temperature should be taken orally in the morning. The baby's temperature is to be taken by rectum (or by axilla if the doctor so specifies) just before the morning bath. The patient and her new baby may be susceptible to any of the general diseases. Certain conditions are apt to occur at this particular time. See discussion of the puerperium in the Chapter 48, "Some Diseases of the Reproductive System."

## *SUMMARY*

The postnatal period extends from 6 to 12 weeks, or until the genital organs and tract have returned to normal

Immediately after giving birth to the baby the mother is encouraged to rest Her exhaustion is usually followed by a feeling of relief While in the hospital she is under close observation to see that the contraction of her organs is progressing normally

The mother needs good nursing care with emphasis on aseptic methods and scrupulous cleanliness She is instructed in self-perineal care before she leaves the hospital Strict precautions must be taken if a venereal condition exists

Since the breasts may become congested and the nipples may become cracked and sore, such symptoms as swelling and soreness are reported to the physician at once, for they may indicate that an abscess is forming

Diet and elimination are important considerations

The length of time in bed has been lessened in recent years, but it depends on the condition of the patient

The mother is given careful instruction to foster her ability to breast feed the infant, for this natural method of feeding is considered ideal

If the nurse sees that any complications are developing, she should describe to the physician at once the symptoms she has observed

### Questions

1 How long does it usually take the uterus to return to normal size and condition after the end of labor?
2 When is an abdominal binder sometimes ordered?
3 How long is it before the mother is allowed to give self perineal care?
4 What precautions should the nurse take if a venereal condition is present? How should she caution the mother?
5 What may be the significance of the breasts swelling and becoming sore?
6 What relief can be afforded the mother with cracked nipples?

7. Make an outline of care of the mother in the home—to serve as a basis for a short paper or talk to be given in class.
8. Name and describe some of the complications of the puerperium which may develop.

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# PART VIII

## *Medical, Surgical, and Orthopedic Patients: Their Nursing Care*

# 43

# SOME DISEASES OF THE SKIN

Most skin diseases arise from external causes, which may be injurious to the tissue of some persons, but which may be harmless to others. The reactions that occur at the site of contact very often consist of abscesses, ulcers, and other inflammations. (See Chap. 6, "Epithelial Tissue.")

The fact that some skin diseases have their origin in other systems and parts of the body obscures the situation, making correct diagnosis difficult and complex. Doctors do not always agree as to the proper treatment of any particular skin disease, but a few principles of treatment and nursing care are generally considered valid.

Acne vulgaris. This disorder is considered the result of a disturbance in the normal function of the sebaceous (oil) glands with superimposed bacterial infection of the sebaceous gland apparatus. Acne makes its first appearance at the age of puberty. The first signs are increased oiliness of the skin, resulting in a muddy complexion and some blackheads. This oiliness is followed by pimples (papules), pus pimples (pustules), and scarring. In some instances deep cysts may be present. The common locations are the face, chest, and back. Increased oiliness of the scalp frequently accompanies this clinical picture. Contrary to the predominant belief that the disease disappears after puberty, there are many instances where acne persists long after that age.

*Treatment* should include a complete medical check-up, including blood count and basal metabolic rate, since improvement does

occur when a secondary anemia or a low basal metabolic rate is found and corrected. Good hygiene and avoidance of irregularities are important. The diet should include plenty of nutritious food, supplemented by vitamins, especially vitamin A. Pastry, chocolate, including cocoa, fried foods, nuts, rich gravy, and pork products should be avoided. Plenty of fresh fruit and vegetables, instead of cathartics, should be used for bowel regulation. Sun and outdoor exercise is helpful. The skin should be thoroughly washed with soap and water at least twice daily. Cold cream should not be used because the skin is excessively oily and should not be made more so.

The local and internal therapy should be advised by the physician and not by a nurse. Marriage and childbearing are no cure for acne, although the old-fashioned belief that they are still persists.

Athlete's foot. This disease is caused by a variety of fungi. It is not common under the age of puberty.

This condition is prevalent mostly on the feet, although other areas may be involved. The lesions in this disorder may vary from cracks or maceration (softening) in the webs of the toes to scaling, blistering, and redness on the soles of the feet. Superimposed pus infection may occur, with resulting enlarged, tender glands in the groins. As a result of allergy to the fungus and its products, blisters or scaling are seen infrequently on the hands.

*Treatment* should be advised by a dermatologist and not by a nurse or friend, since a correct diagnosis is essential. Not every crack, scale, or blister of the feet is caused by athlete's foot. As a result of misdiagnosis and wrong treatment, patients are caused suffering and discomfort. Hygiene and prophylaxis (preventive measures) should be stressed. The feet should be kept clean and dry. Paper towels and paper slippers should be burned. Fresh socks should be worn every day.

Boils or abscesses are caused by bacteria which enter breaks in the skin, or through infection of hair follicles. Pus forms as a result of the invasion.

Sometimes boils can be absorbed by immediate local treatment, which should always be prescribed by a physician. A boil should never be incised except by the doctor. Under the treatment of a physician, boils may sometimes be resolved by the local or systemic use of an antibiotic, such as penicillin.

A boil should never be poulticed unless ordered by the physician.

Poulticing may spread the infection by softening the surrounding tissue, thus making a good place for the organism to grow. If poulticing is ordered, cover the area for two inches around the infected spot with an ointment before you apply the poultice. Always save a specimen of urine for the physician, because some patients who have a susceptibility to boils shows traces of sugar in the urine, and this condition should be corrected.

Cleanliness and proper diet, ensuring adequate nutrition, are essentials in nursing care. The skin should be protected at points of friction. The patient may be ordered to remain in bed.

A carbuncle is a deep-seated abscess and may carry serious complications. Extensive antibiotic therapy, surgery, or both is usually indicated. The urine should be examined for the presence of sugar. The aftertreatment consists of free drainage. The resulting wound takes a long time to heal.

Contact dermatitis. This condition is an inflammation of the skin caused by external irritants. It is sometimes caused by overtreatment, advised by inexperienced individuals, which converts a simple skin condition into a complicated one. Poison ivy and certain other plants, as well as cosmetics, hair dye, hair tonics, lacquers, waving solutions, soaps, detergents, paints, and varnishes, may cause dermatitis in sensitive persons. The skin is red and covered with small blisters. Itching is troublesome and scratching by the patient makes the disease worse.

The condition is difficult to clear up unless the offending factors are discovered and removed. The treatment must be prescribed for the individual needs, for what helps one person may not help another.

Eczema. The name eczema covers a great many skin diseases of unknown origin. In the form most commonly seen, irregular, dry, and scaly patches on the skin itch intensely. In other forms of eczema the diseased area may be moist and oozing. One type of eczema may be caused by diet and controlled by restricting certain foods. The cradle cap seen in infants, which may spread over the face and forehead, is a form of eczema.

Patients with eczema are very uncomfortable from itching, burning, and sleeplessness, which are the chief symptoms of the disease.

*Treatment* usually consists of medicated baths and applications of prescribed ointments. Indiscriminate use of soap and water on

the skin usually makes eczema worse. When an ointment is applied to the skin, it should be covered with a piece of soft linen and held in place by bandages. Sometimes it is necessary to cover the whole face with a linen mask, with holes cut out for the eyes, nose, and mouth. Since most ointments leave stains which cannot be removed, care should be taken to use old clothing and bed linen which can be destroyed. Everything possible should be done to allay itching by proper application of treatments. Restraint is important to prevent children from scratching the inflamed skin. Well-padded pasteboard cuffs, so arranged that the child can use his arms but cannot bend his elbows, are often necessary.

Impetigo contagiosa is an infection of the skin caused by bacteria, most commonly the streptococcus or staphylococcus. Very contagious, it can be carried on objects or clothing. Babies and children are easily infected.

The type of impetigo seen in school children first appears on the face and hands as small red spots followed by blisters, which later become larger honey-colored crusts. The lesions spread very rapidly unless treatment is given. Impetigo may complicate pediculosis capitis, scabies, and other itching conditions, as a result of scratching and infecting the skin.

*Treatment* commonly consists of washing the crusts gently with a solution ordered by the doctor. The crusts should not be forcibly removed. Mineral oil is useful in softening the crusts, which may then be gently removed.

Baths should not be given, and the child should not be allowed to go swimming. A child who persists in scratching himself should wear cuffs made of pasteboard, as scratching spreads the disease from one part of the body to another. All linen used by the infected person must be kept separate and boiled before being used by anyone else.

Infantile impetigo. The type of impetigo seen in the newborn baby first appears as a small blister. This should be reported immediately to the physician, as it spreads very rapidly unless the blister is dried up. The physician usually opens the blister and orders lotions and powders to be applied at regular intervals.

Antibiotic therapy is advisable to prevent serious complications.

Pediculosis is caused by animal parasites called *pediculi.* The pediculi or lice are of three types. The most common one appears

in the hair, another type appears on the body, and the third on the pubic region The lice lay eggs or nits, which appear as white specks firmly attached to the individual hairs The eggs hatch out in five to seven days and the parasites may become quite large Enlarged glands or any excoriations around the face or neck may indicate pediculosis This is not a filth disease, as is commonly thought It is easily acquired by school children who try on each other's hats or put their heads close together

The procedure for ridding the head of pediculi is described in Chapter 27, "General Care of the Patient"

Psoriasis The eruption is characterized by discrete or confluent pimples (papules) covered with silvery scales, which, on removal, leave pin point bleeding areas Any part of the body may become involved, but the elbows and the knees are favorite sites The scalp, especially at the hair line, is frequently affected The nails may show pitting and discoloration Involvement of the joints, in appearance like rheumatoid arthritis, may occur It is important for the patient to learn how to scrape off the scales without introducing a secondary infection The patient is benefited by exposure to sunlight

This disease is responsible for about 4 per cent of all skin conditions It has a tendency to run in families Negroes are rarely affected Although it may occur at any age, it is most common in young adults The eruption usually improves or clears up in the summer, especially after judicial sun exposure

The cause of this affliction is, at present, not known, therefore the treatment is unsatisfactory However, severe cases can be controlled with judicious treatment under the supervision of a dermatologist

Ringworm of the scalp This condition is an infection of the scalp caused by different species of vegetable parasites (*fungi*) The clinical appearance of the involved areas varies from scaliness to grayish broken-off hairs, from the presence of inflammation to carbuncle like formations The loss of hair is usually not permanent, except where there is marked inflammation followed by scarring Round patches with scaling borders and clear centers may be present on the face, extremities, or body The ringworm of the body is called *tinea corporis*

Ringworm of the scalp is a disease of childhood It rarely occurs after the age of puberty The disease is transmitted by pet animals,

infected children, and contaminated articles, such as caps, combs, brushes, and the backs of theater seats.

*Treatment* of this infection should include investigation of the original source of infection. The child with ringworm of the scalp and other members of the family under the age of puberty should be seen by a dermatologist and treatment should be outlined by him. A boilable cap should be worn by the child under the outer cap. The inner cap must be boiled for at least 20 minutes and changed at least once daily. The infected hairs must be removed with forceps, collected in a newspaper, and burned. The hair should not be combed much; a metal comb which can be boiled is preferred. The dermatologist should decide whether or not the child may attend school.

Scabies. This disease is due to microscopic parasites which burrow into the horny layer of the skin. Symptoms do not appear until one to three months after the original infection. Sometimes the only symptom is intense itching, especially at night; but in most cases the skin is covered with small red spots and close inspection shows tiny burrows, especially between the fingers.

Scabies usually spreads through the family by means of the blankets and other bedding. Everything that has touched the patient must be boiled or pressed twice with a hot iron.

*Treatment.* Scabies may be treated in various ways. The most important part of the treatment is to wash the entire body thoroughly to open up the tiny blisters and burrows. Treatment called the 24-hour treatment consists of the application of a special ointment ordered by the physician to every part of the body except the face for 24 hours. This is not repeated unless ordered by the physician.

Another treatment consists of a wash under a physician's direction. This latter method is very effective and avoids the necessary restriction of the 24-hour treatment. All other infected individuals in the family should be treated at the same time. It is a good public health procedure to attempt to *find the original source* of the infection.

Urticaria or hives. The lesions of this condition sometimes resemble large mosquito bites. They appear very suddenly and may cover the entire body. The itching is intense. Urticaria may be caused by certain foods, such as shellfish and strawberries, to which the patient is sensitive. It is often seen after the injection of serums,

such as diphtheria antitoxin or pneumonia serum Emotional disturbances may also cause hives, as also may hypersensitivity to certain drugs Penicillin is a common offender

*Treatment* Hot cornstarch baths are sometimes ordered to relieve the itching Hypodermic injections of certain drugs are often used

In cases of food urticaria, the patients usually discover for themselves what causes the difficulty, but sometimes food tests by a specialist may be necessary

A complete medical check up may be necessary to find a systemic cause in chronic urticaria

## *SUMMARY*

The most common diseases and disorders of the skin include

| | | |
|---|---|---|
| Acne vulgaris | Eczema | Ringworm of the scalp |
| Athlete's foot | Impetigo contagiosa | Scabies |
| Boils | Infantile impetigo | |
| Carbuncles | Pediculosis | Urticaria |
| Contact dermatitis | Psoriasis | |

These diseases have various causes often requiring specialized diagnosis This fact emphasizes

1 The need of the nurse to follow doctor's orders exactly and conscientiously
2 The advisability of discouraging self medication, which is likely to complicate the condition rather than to cure or relieve it

If the cause of the skin disorder is an allergy, the source of the difficulty will be sought by the doctor The nurse can cooperate by seeing that dietary restrictions are carried out rigidly, and that records are kept fully and accurately

If the disease is even suspected of being contagious, all soiled dressings, paper cups, towels, and slippers will be burned when ready for disposal Scrupulous cleanliness should be supplemented by strict observance of precautions to prevent the spread of a communicable disease

Some of the measures employed in caring for patients with skin disorders include

1 Protective dressings hot or cold, wet or dry, open or covered
2 Cellophane wrappings instead of bedclothes

3. Pajamas saturated with the solution ordered, when the area to be treated is extensive
4. Bed cradles to keep the bedclothes from resting heavily on the patient's legs
5. Pledgets soaked in sweet or olive oil; fluffs for drying surfaces; gauze for covering dressing which should remain moist

Since wastes are normally excreted through the sweat glands, and would form poisonous substances if left in the system, it is very important that bed patients have a daily cleansing bath to prevent bedsores, boils, and toxic conditions. Ill persons, who are unable to perspire freely because of their inactivity and their sweat glands, need stimulation. However, a daily soap-and-water bath for individuals with dry skin, for old people, and for newborn babies may be dangerous, since such a bath removes oil which acts as a natural protection for the skin.

The psychological effects of a disfiguring skin disease deserve more than ordinary sympathetic understanding. The patient's morale is often lowered by sleepless nights, by itching and irritation, as well as by the rude curiosity of the gaping public. He becomes self-conscious, embarrassed, and humiliated. The nurse has a special need to be patient, untiring, and kind, so that not only will she appear to be encouraging, but also will contribute to the recovery of her patient by giving him intelligent "complete care."

## Questions

1. If a 15-year-old boy asked you what foods he should eat and especially what he should eat to keep his complexion unblemished, what would you suggest?
2. Name several contagious skin diseases.
3. Name one skin disorder likely to be caused by emotional disturbance.
4. What is meant by "complete" or "total" nursing care?
5. Discuss the value of face creams and the ingredients they may contain. When should they not be used?
6. Would a situation ever arise in which a newborn baby or an aged patient should not be given a daily soap and water bath?
7. What factors are important in maintaining the health of the skin?
8. Consult the Glossary for the meaning of the following: excoriation, herpes, idiosyncrasy, lesion, parasite, pediculosis, susceptible.

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# SOME DISEASES OF THE CIRCULATORY SYSTEM

## *HEART DISEASE*

The symptoms noted by patients with heart disease result from difficulty of the heart in maintaining adequate circulation The work of the heart is regulated primarily by the requirements of the body for oxygen, since the heart is responsible for the circulation of blood, which, in turn, carries the oxygen to the tissues Excessive work beyond its capacity results in the symptoms of heart disease (See Chap 9, "The Circulatory System") The following paragraphs, therefore, will be devoted to discussing the symptoms of heart disease and the care of the patient with heart disease

Many patients whose heart valves are damaged have no symptoms relative to their heart They can do anything a person with a normal heart can do because the heart muscle is healthy and the extra work placed upon the heart by the scarred valve is only slight This means that the reserve strength of the heart, which under normal conditions is enormous, can carry on increased work without difficulty Such people, of course need no treatment When the heart has been damaged from scarring of the heart valves resulting from

rheumatic fever, or scarring of the heart muscle as a result of coronary heart disease, the heart becomes dilated and symptoms of "heart failure" develop. The important symptom of congestive heart failure is shortness of breath on effort or sometimes from lying flat in bed. This symptom, related to breathing, results from congestion of the lungs with blood. When this congestion has existed for some time, the amount of tissue fluid in the body increases and accumulates in the abdomen or lower extremities. It is still unknown why this fluid accumulates, but it represents a retention of sodium chloride and water by the kidneys.

The other common symptom resulting from heart disease is a choking sensation under the sternum, or breastbone, described by patients with angina pectoris. This usually follows effort but may come during the night or when the patient becomes excessively nervous. The cause of this pain or distress is a real ache of the heart muscle resulting from an insufficient blood supply to the heart muscle. The exact description of the patient varies considerably and the location of the pain or distress varies a good deal. It may occur in the arms and epigastrium (upper abdomen) as well as in the chest. This sensation usually disappears in five or ten minutes if the patient rests. When the symptom lasts for more than half an hour and is quite severe it is likely that the patient has suffered an occlusion of one of the coronary arteries of the heart. The coronary arteries are two in number and supply the heart muscle with blood. A clot formation in one of these arteries is known as a *coronary thrombosis*, or *heart attack.*

## PRINCIPLES OF NURSING CARE

The important consideration in the nursing care of a patient with heart disease is to relieve his symptoms and make him as comfortable as possible. If the patient is having considerable shortness of breath, he is usually much more comfortable in the sitting position. Often it is better to have the patient spend most of his time in a comfortable chair. This position also enables more of the excessive fluid to accumulate in the lower legs, where it is less likely to aggravate the shortness of breath than in the lungs. Sleep is important for these patients and the nurse should use every effort to see that the patient obtains adequate sleep. Often the decision whether or not to give a

sedative, and at what time he needs it, is left to the nurse Under such circumstances, it should be given if any doubt exists about whether or not the patient will sleep well Many of these patients require considerably more rest than normal and it is the duty of the nurse to do things which will reduce their muscular effort to a minimum The patient's preference as to foods, amusement, visitors, and the minute details which become so important to the sick should be studied and carried out so far as possible, since by doing so his comfort is enhanced It is, however, obligatory to adhere to the physician's orders

## *DISEASES AFFECTING THE HEART AND ARTERIES*

**Active rheumatic fever.** Rheumatic fever is predominantly a disease of childhood, but it may occur, usually in a milder form, during adult life It characteristically affects the medium-sized or larger joints in the body It is migratory, in that one joint may be affected for two or three days only It does not result in any lasting damage to the joints The disease is a generalized systemic one, affecting almost all of the blood vessels of the body The heart seems to be particularly prone to injury and if the heart muscle is seriously damaged, congestive heart failure frequently develops and may prove fatal The disease usually clears up in the course of weeks or months and leaves no deformity of the joints The heart valves may, however, be deformed and scarred as a result of this infection The cause of rheumatic fever is still obscure, although a significant percentage of patients with rheumatic fever have had a previous streptococcic infection two or three weeks preceding the onset of the arthritis Cortisone from adrenal cortex seems to have a favorable effect upon these patients during their acute illness, although it is still uncertain whether it is superior to large doses of salicylates

**Rheumatic heart disease.** Chronic rheumatic heart disease involves the mitral or aortic valves on the left side of the heart, often causing valvular damage This condition may develop many years after the active infection, and about a third to a half of the patients who have rheumatic heart disease fail to give a history of active rheumatic fever In these patients it is assumed that the rheumatic

fever has been active though subacute, and has not produced any symptoms or any fever. These patients may go for several decades before the heart finally fails as a result of the added burden resulting from damage to the heart valves.

New surgical techniques have been developed to relieve patients who have a narrow or obstructed valve (mitral valve) by making the valve opening larger.

Pericarditis is an inflammation of the membranous sac covering the heart and may be due to different causes, such as active rheumatic fever, bacterial infection of the pericardial sac, or probably from a viral infection. In certain patients with a healed or healing tuberculosis infection involving the pericardial sac, constriction of the heart which may result has been found to be alleviated by surgical means.

Arteriosclerosis is a disease of the arteries of the body, usually affecting the large arteries, and commonly referred to as "hardening of the arteries." The cause of this process is unknown but hereditary factors seem to be important in the predisposition to this disorder. There is also evidence to suggest that diets rich in animal fat predispose to this condition; and diets low in animal fat appear to result in a decrease of arteriosclerosis. This type of process may affect all or any of the arteries of the body. The symptoms and signs of the disease depend upon the particular part of the body affected. For instance, a mild degree of arteriosclerosis in the legs may cause cramps in the calf muscles during exercise, which may be relieved by rest. If the arteries in the brain are affected, there may be premature degeneration of the brain cells resulting in mental deterioration. This same process, when it involves the coronary arteries which supply the heart with its blood, is the common cause for angina pectoris.

Coronary thrombosis, commonly termed "heart attack," is a clot formation within one or more arteries of the heart and usually results in chest pain of varying severity lasting several hours. The clot formation deprives a portion of the heart muscle of its blood supply so that it dies as a result of lack of oxygen and nourishment. The injury to the heart muscle is the important result of coronary thrombosis and is called *myocardial infarction*. The injured muscle is replaced by scar tissue after two weeks so that the heart muscle is again fairly strong. The cause of death following myocardial infarction usually resulting from coronary thrombosis is either a rupture of the heart

cardiac standstill, or rapid fibrillation (quivering) of the heart Many people recover from this injury and may go several years before a recurrence of the condition

Hypertension, or high blood pressure, is a condition resulting from an increase in pressure in the arterial system The cause of hypertension in the great majority of cases is unknown There are certain factors which suggest that this disease may be in part hereditary It is not uncommonly associated with kidney disease and may occasionally result from tumors of the adrenal gland There is no convincing evidence that nervousness is a predisposing factor in hypertension, although it may aggravate the high blood pressure The symptoms resulting from hypertension are usually headache, occurring characteristically in the early morning, or some injury to the heart, brain, or kidneys, where it usually produces complications The treatment is not very satisfactory and not many nerve operations are being done for this condition at present There are several drugs now available which seem to have a favorable effect upon certain patients with high blood pressure

Subacute bacterial endocarditis Bacteria sometimes become lodged, usually on the heart valves, and form a wartlike mass which contains many bacteria This may be an acute process, in which case the valves are usually normal There is a subacute form of the same disease which usually attacks scarred valves and may last for weeks, producing malaise (general indisposition), weight loss, and low-grade fever This disease was formerly nearly 100 per cent fatal However, with the introduction of antibiotic therapy, about 80 per cent of these patients can be cured if treated adequately The dosage of the antibiotic, however, at times has to be tremendous The failures are due either to a very resistant organism or to complications such as congestive heart failure

Heart failure may be of two types

1 Failure of the heart from extensive damage to the muscle, as in extensive myocardial infarction or myocarditis This process is usually rapid and present for only a few days with either death or recovery from the excessive weakness of the heart muscle It is manifested by weakness, hypotension (fall in blood pressure), and, at times, shortness of breath

2 Chronic congestive heart failure is perhaps better called congestive circulatory failure, since the circulation to the brain and

kidneys is an important feature of this condition. It is a common end stage of any type of heart disease which seriously impairs the ability of the heart to respond and put out blood the way it normally does. The retention of salt and water in the tissues seems to be the predominant physiological change in heart failure. It results in accumulation of fluid in the tissues and serous cavities of the body. Because of congestion of the lungs in most patients with this type of heart failure, the symptom of dyspnea, or shortness of breath, is a predominant one. The patient also manifests some weakness in the end stage as a result of inability of the heart to pump an adequate amount of blood. The cause of this accumulation of fluid remains obscure. The posterior portion of the pituitary gland and the kidneys are intimately concerned with the regulation and excretion of body fluid.

## *OTHER DISEASES OF THE BLOOD VESSELS*

Varicose veins are veins whose walls have lost their usual supporting structure and dilatation of the vein has resulted. This causes a slowing of the circulation in them and a "backing up" of the blood in the venules which empty into them. The result is that the tissue from which the varicose veins should drain the blood becomes congested, and its nutrition suffers so that ulcers form, usually on the inside of the leg. Under normal circumstances, the veins, plus the muscular massage from exercise, enables the blood to be returned to the heart. The reason why the walls lose their strength is unknown. There seems to be a hereditary factor, since varicose veins are more common in some families than in others. When the varicose veins, particularly of the lower extremities, are excessive, the venous return is impaired and stagnation results. This, at times, leads to ulcers on the inside of the legs.

The important consideration in caring for varicose veins is either their removal by surgical means or by supplying adequate support to the limbs. This can be done either with elastic stockings or by elastic or rubber bandages around the legs. Pregnant women and people who stand long hours at their work are apt to have varicose veins. Elevation of the leg to encourage venous return is helpful.

Hemorrhoids are varicose veins in the wall of the rectum. If they protrude beyond the sphincter muscle, they are called "external"

hemorrhoids, if they do not, they are termed "internal" They often cause intense itching and also pain during defecation They may bleed quite profusely It is never safe to assume that bleeding from the rectum is due to hemorrhoids It may be caused by a growth in the bowel above the hemorrhoids The treatment of hemorrhoids depends on the severity of the discomfort they cause and whether or not they are responsible for continued bleeding If bleeding is not a factor, and if the discomfort is slight, the physician may make the patient more comfortable by ordering soothing suppositories If the disturbance is more severe, the hemorrhoids should be treated by a surgeon

Phlebitis is the term used to indicate inflammation of the lining of the vein accompanied by a clot of blood in the vein This is much less common, however, than a simple clot of blood in the vein as a result of stagnation of the circulation Conditions predisposing to a clot formation in the vein are pressure on the vein, such as occurs in the uterus in pregnancy, tumors of the pelvis, or varicose veins When the clot is extensive, and when the leg remains swollen for a long time, it is referred to as a *milk leg* There is a significant reduction in muscular activity It is frequently associated with some tenderness in the calves of the legs and possibly with a low-grade fever It is common in patients with typhoid fever It has become less common since early ambulation of surgical and medical patients has been practiced Some activity of the legs and preferably some pressure of the feet against the foot of the bed are advisable to prevent clot formation During the past decade, drugs have been used to advantage to prevent clot formation, the outstanding drugs being Dicumarol, given by mouth, and heparin, which is given by injection The chief danger from clot formation, particularly in the large veins of the legs, is that the clot or embolus may become dislodged and travel to the lung This condition is known as pulmonary embolism It may result in quite sudden death characterized by collapse, rapid heart action, and, at times, shortness of breath The veins of the upper legs are occasionally tied in order to prevent this occurrence, although this treatment is not entirely effective The use of anticoagulant drugs to discourage clot formation has been helpful in this regard

Arteriosclerosis of the lower extremities, in which the larger arteries are sometimes closed, is the result of two diseases Arterio-

sclerosis is common in patients with *diabetes mellitus*, when the patients are usually over the age of 50. A common symptom of this condition is claudication (lameness) of the leg, or pain in the muscle after exercise. This is to be distinguished from *Buerger's disease*, which affects people primarily before the age of 40 and may result in gangrene. This disease affects both the arteries and the veins and is found almost exclusively in males who use tobacco. Exclusion of tobacco is perhaps the most important consideration in treatment. In both of these conditions affecting the lower extremities, Buerger's exercises are often helpful. They consist in alternately raising the leg, lowering the leg, and holding it at body level several times in succession at different periods during the day. Such manipulations seem to increase the circulation to the affected part.

Gangrene means the death of body tissue due to insufficient blood supply. It occurs as the result of embolism, thrombosis, or arteriosclerosis, usually of the legs. The only treatment of any use is preventive treatment: that is, particular attention to the circulation of patients having any of the diseases likely to cause gangrene.

Some of the drugs used in the treatment of conditions affecting the heart are discussed in Chapter 36, "Drugs as They Affect the Systems of the Body."

## GENERAL NURSING CARE IN THE HOME

Support in bed. If the patient needs to be propped up, he can be made more comfortable in a Gatch bed where the head of the bed can be raised or lowered mechanically. In the absence of such a bed, a back rest provides a firm support for pillows. The method of placing the back rest and pillows to provide support for the feet is described in Chapter 28, "Securing the Patient's Comfort." The use of a comfortable chair is often preferable to the use of a bed for these patients.

Visitors. Patients react differently to visitors. The nurse should use her discretion in admitting visitors to see the patient. It is most important that the visitor does not stay such a long time that the patient becomes tired or nervous. For sick patients, a visit of from 5 to 15 minutes is all that should be allowed. The number of visitors at one time, as well as the number of visitors during the day, should

be limited if the patient is seriously ill, nervous, or excitable (Every hospital has its own rules concerning visitors)

Sleep The patient should get some rest during the day as well as have a good night's sleep The patient's room should be in a quiet part of the house Any disturbing noises such as loud talking, bells ringing, banging of doors or rattling of kitchen utensils should be prevented whenever possible There should be plenty of sunshine and fresh air, but the room should not be allowed to become too cool

The diet The diet may vary considerably depending upon the type of heart disease In certain patients the rigid restrictions of sodium in the diet is important in the prevention of dropsy This often requires careful searching for sources of sodium in the diet It may be important to administer the food in small portions during the day so that the patient consumes six small meals rather than three large ones The intake of water and fluids is usually desirable and seldom should be restricted The amount of fluids which the patient should be given will be decided by the physician The intake and output measurements are also of help at times and should be recorded Special mouth care may be helpful in increasing the appetite (See Chap 19, "Diet in Disease")

Care of the bowels Constipation should be avoided since the accumulation of gas in the intestines frequently causes pressure and discomfort in the abdomen If this becomes excessive, the movement of the diaphragm is impaired and more severe shortness of breath results

Bathing The daily bath is necessary and not only refreshes the patient but promotes circulation This is especially true of the lower back where particular attention should be given to the prevention of bedsores (See Chap 30, "Care of the Aging, Aged, Helpless, or Dying Patient")

Exercise is often desirable as the patient's condition improves The patient should limit his exercise below that point which will produce discomfort or distress Encouragement on the part of the nurse is frequently necessary for patients who have been in bed for some time Most patients with heart disease are now allowed to sit in a chair part of each day This helps to prevent the muscular weakness which results from prolonged bed care It also aids the circulation and reduces the number of patients who develop phlebitis

## BLOOD BANKS AND BLOOD GROUPING

Blood banks have become important, particularly in hospital care, for the transfusion of whole blood or plasma. The blood bank is the place where the blood is drawn and stored in refrigeration until it is used. Blood banks are also of use in time of war and disaster to combat shock and blood loss resulting from hemorrhage.

In order to prevent serious reaction at the time of a transfusion, the typing of blood is necessary so that the patient will receive the proper type. The human blood groups are as distinctive and individual as finger prints, and number 15 or more.

Blood groups. There are four main blood groups: AB, A, B, and O. Blood from an individual of one group given to an individual of another group may cause a reaction due to the clumping of red cells.

Blood group O has no red cell factor to cause clumping by the plasma of other blood groups. It can be given (donor) to any blood group and is called a *universal donor*. Type AB can receive (be the recipient of) the blood of any other group, since his plasma cannot clump the red corpuscles of any group and is called the *universal recipient*.

There are several other blood subgroupings, the only one of importance being those so-called Rh factors which are responsible for an anemia of newborn infants where the mother is Rh negative and the infant Rh positive. Also repeated transfusions of Rh-positive blood to Rh-negative individuals leads to transfusion reactions.

## SUMMARY

The diseases discussed in this chapter are: active rheumatic fever, rheumatic heart disease, pericarditis, arteriosclerosis, coronary thrombosis, hypertension, subacute bacterial endocarditis, heart failure, varicose veins, hemorrhoids, phlebitis, Buerger's disease, and gangrene.

Blood banks have been built up in some hospitals in most large cities so that blood is readily available for the increasing use of transfusion.

The symptoms and nursing care of patient's with some heart disease are summarized below:

Some persons with damaged heart valves have no symptoms of

heart disease because the damage to the heart is slight and the heart is strong enough to carry on the increased work without difficulty These persons need no treatment

However, when the heart has been seriously damaged as a result of rheumatic fever or coronary heart disease, symptoms of congestive heart disease develop Shortness of breath and a choking sensation under the sternum are significant symptoms of heart failure When these sensations are long lasting, it is probable that the patient is suffering from a coronary thrombosis, or heart attack

Important considerations in nursing care are to relieve the symptoms and to make the patient comfortable Often he is most comfortable sitting in a chair If he is confined to bed he can be propped up if he does not have a mechanical bed which can be adjusted to a semisitting position

The patient's preferences in all matters should be given consideration, but the physician's orders must be followed if there is any conflict between the patient's wishes and the doctor's orders

The number of visitors allowed is a matter of discretion, doctor's orders, or hospital rules, but in general the patient should be kept quiet and undisturbed He should rest during the day as well as have a good night's sleep The diet may vary, but some patients have rigid restriction of sodium Six small meals are better than three large ones A daily bath aids circulation Limited exercise is often beneficial Sitting in a chair at least part of the day is generally recommended

Special equipment for the unit in the hospital, such as shock blocks, intravenous material, suction, and oxygen, is the responsibility of the head or senior nurse

Questions

1 What is the cause of the symptoms of heart disease?
2 When the heart valves have been scarred, how does the heart, as a whole, react?
3 What is the most important symptom of congestive heart failure?
4 What is the second most significant symptom?
5 If this symptom is prolonged more than half an hour, what has the patient probably suffered?
6 What is the clot called that forms in one of the arteries which supplies the heart with blood?

7. What parts of the body does active rheumatic fever affect?
8. What infection often precedes the onset of rheumatic fever?
9. What part of the body is involved in chronic heart disease?
10. Discuss some causes of pericarditis.
11. What is the common name of arteriosclerosis?
12. Upon what do the symptoms of arteriosclerosis depend?
13. Discuss coronary thrombosis.
14. What is the cause of death following myocardial infarction resulting from coronary thrombosis?
15. What is the common name for hypertension?
16. Discuss hypertension
17. What type of drugs have been found beneficial in subacute bacterial endocarditis?
18. What are the two types of heart failure? Discuss each.
19. Describe varicose veins.
20. What two treatments are often used for varicose veins?
21. Where are hemorrhoids located? Name two kinds of hemorrhoids.
22. When are suppositories ordered for hemorrhoids?
23. What has been the effect of early ambulation on the number of patients suffering from phlebitis?
24. Under what conditions of the circulatory system is the exclusion of tobacco a most important consideration of treatment?
25. What does gangrene mean or imply?
26. What preventive measures against gangrene may be taken?
27. How can a back rest in bed be improvised if the patient does not have a Gatch bed?
28. Discuss the advisability of the patient's having visitors.
29. When a heart patient has an excessive amount of fluid in his system, is the intake of fluids ordinarily restricted?
30. What is the effect of constipation on the diaphragm of the patient with heart disease?
31. What is the effect of the daily bath upon circulation?
32. Discuss the advisability of exercise for heart patients.
33. What is a blood bank?
34. What type of blood is termed "universal donor"? Why is it so called?
35. What type of blood is termed "universal recipient"? Why is it so called?
36. When the mother is Rh negative and the infant is Rh positive, what condition may develop in the infant?
37. Why is it important for a married couple before pregnancy to have their blood Rh-tested?

# 45

# SOME DISEASES OF THE DIGESTIVE SYSTEM

Tongue Although there are few diseases of the tongue itself (except cancer and ulcer or canker), it definitely reflects changes in health Its color, dryness or moisture, muscular control, and the presence and nature of "coating" are all significant, and a study of a patient s tongue will often give valuable information

Acute indigestion As the result of too heavy a meal or inability of the stomach to take care of the food, a large amount of gas may be formed and cause dilatation of the stomach This dilatation may be so great that it presses against the heart In healthy people this is not serious, but it is very uncomfortable In patients with heart disease the pressure of the overfull stomach may seriously interfere with the heart action

If the heart has already been seriously damaged, it may be unable to recover, and the patient may die Patients with diseased hearts should never "overeat"

Chronic indigestion, or dyspepsia This condition is due to disturbed secretion of gastric juice so that there is too much or too little, or to the stomach's emptying at an abnormal rate, too rapidly or too slowly It is not often due to any disease of the stomach itself but is generally secondary to constipation nervous disturbances (see

Chap. 56, "Some Diseases of the Nervous System"), or to some disease which disturbs the activity of the entire body—anemia, for example.

If the dyspepsia is associated with overactivity of the stomach, a mild alkali is sometimes ordered for temporary relief.

Ulcers of the stomach. In individuals with chronic overactivity of the stomach, ulcers frequently develop. The ulcer is generally at the pyloric end or just below the pylorus in the duodenum. The part that hyperacidity plays in production of the ulcer is not clearly understood, but the two conditions are usually associated.

*The treatment* of both chronic indigestion and ulcers is a low-residue, or bland, diet, which should be rigidly scheduled and maintained for a year after all symptoms have disappeared, in order to ensure a cure. Bed rest and adequate sleep free from distraction are recommended. (See Chap. 19, "Diet in Disease.") Sometimes there is so much inflammation or the ulcer is so large or obstructive that it is useless to attempt a cure by diet, and an operation may be necessary. The ulcer may perforate the stomach wall, thereby causing acute pain and collapse; an emergency operation must then be performed. The complication of such "perforation" is general peritonitis.

Food poisoning is very common. It was formerly called ptomaine poisoning but it is now known that ptomaine poisoning forms only a small percentage of cases. Attacks of food poisoning cause stomach ache, intestinal cramps, vomiting, and diarrhea, due to the action of bacteria in the food. This action may take place without affecting the taste of the food.

Chemical poisoning is discussed in Chapter 37, "Emergencies."

Intestinal obstruction means complete or nearly complete stoppage of food or waste matter along the intestinal tract and may be due to various causes. Sometimes an operation is necessary to remove the cause. *Intussusception,* a slipping or telescoping of one part of the intestine into another, is fairly common in infants.

A hernia, or rupture, is the protrusion of an abdominal organ (almost always bowel) through the muscular wall of the abdomen. It occurs at some naturally weak spot, such as the navel or the groin. It may follow pregnancy. Hernia can usually be cured by operation, but, if it is causing little trouble, it may sometimes be controlled by a belt or truss.

Typhoid fever. This disease is caused by the typhoid bacillus, which attacks the intestinal tract It is considered in Chapter 54, "Some Communicable Diseases"

Tapeworm. The eggs of the tapeworm gain entrance to the body in undercooked meat or fish The worm is long, flat, and segmented, but the head is very small As the worm grows, the lower segments break off and appear in the stools

*Treatment* commonly consists in giving a drug to poison the worm, the drug being followed by a cathartic Unless the head is expelled from the intestine, new segments keep forming, and the patient is not cured Treatment must then be repeated after a suitable interval

Appendicitis is inflammation of the appendix due to the action of bacteria The inflammation may subside spontaneously but more often it does not If it does not subside, there is danger that the appendix may rupture, causing local or general peritonitis Since it is impossible to determine in the majority of patients whether the inflammation will or will not subside, removal of the appendix is indicated as a measure of safety, once the diagnosis is established We know of no way of preventing appendicitis, but it is more common in constipated individuals.

*The symptoms* of appendicitis are abdominal pain, nausea, vomiting, and fever So differently, however, does the disease appear in different individuals that it may easily be confused with other diseases with similar symptoms, therefore, *a cathartic should never be given to a patient suffering from acute abdominal pain, nor should heat be applied to the abdomen* Any abdominal pain should immediately be reported to the physician for diagnosis, especially when accompanied by nausea and vomiting

Peritonitis is caused by infection of the peritoneum (the membrane which lines the abdominal cavity and covers all the abdominal organs) The infection is generally secondary to acute inflammation in the digestive tract—that is, appendicitis

Local *peritonitis* is inflammation in a limited area, as around a slightly inflamed appendix

General peritonitis is inflammation involving the entire cavity, a very serious and often fatal condition

Tuberculous peritonitis is almost always secondary to tuberculosis elsewhere in the body

Colitis is inflammation of the mucous membrane of the colon. The symptoms are abdominal discomfort and often alternating periods of constipation and diarrhea.

Jaundice. This term is used to describe the yellow discoloration of the skin and whites of the eyes that takes place when either a disturbance of the elimination of bile from the body or an abnormal increase in its production occurs. The skin and eyes are bile-stained; the urine is dark brown in color because some of the excess bile is eliminated through the kidneys; and the stools become light-colored or even grayish because the bile cannot enter the intestine. (This occurs in "obstructive" jaundice.)

The conditions that cause disturbance of elimination of bile are:

1. Inflammation or scarring of the liver itself
2. Inflammation of the ducts through which the bile passes from the liver to the intestine and inflammation of the gallbladder
3. Mechanical obstruction of the bile ducts by cancer, scars, or gallstones

Conditions 2 and 3 include the majority of the causes of jaundice.

The conditions associated with an abnormal increase in bile production are those causing too rapid destruction of red blood corpuscles—that is, certain forms of anemia. This type of jaundice is rare.

Acute infectious hepatitis. This condition is seen in persons of all ages but most often in young people. It is due to a virus transmitted in stools and in the blood which causes inflammation and destruction of liver cells. The patient is sometimes nauseated and unable to eat and at other times feels well. The condition may last for two weeks to several months. The most important treatment consists of bed rest and a good diet.

Cholecystitis, or inflammation of the gallbladder, is due to infection of the lining membrane of the gallbladder. The action of the bacteria causes it to swell, and this interferes with its normal function. There is usually no jaundice, as the bile duct is not obstructed. Frequently cholecystitis subsides spontaneously, but, if there are repeated attacks and especially if the inflammation becomes chronic, removal of the gallbladder may be necessary.

Cholelithiasis. "Stone" in the gallbladder or bile ducts is the result of inflammation of the gallbladder. Because of the inflammation, the bile often becomes thickened and small crystals form in it.

As the formation of crystals goes on, they stick together, forming "stones," which may vary in size from a grain of sand to an English walnut The bacteria which have caused the original inflammation of the gallbladder are often found in the stones

*Symptoms* If the stones are small, they may pass out of the gall bladder into the bile duct and so into the intestine This process is usually accompanied by an attack of cramplike pain called a gall stone colic, which lasts until the stone is passed The pain is accompanied by vomiting and prostration There may or may not be jaundice, depending upon whether or not the stone is large enough to obstruct the duct Sometimes a stone gets stuck in the common bile duct and can get no farther Such a condition requires surgical treatment Surgical removal of the gallbladder is known as cholecystectomy

Cirrhosis of the liver is due to destruction of the liver cells and overgrowth of connective tissue Its causes are not well understood There may be jaundice or dropsy Cirrhosis is slowly progressive until it causes death

Cancer of the liver is discussed in Chapter 51, "Malignant Tumors"

Disease of the pancreas The important and common disease of the pancreas is diabetes This disease is discussed in Chapter 49, 'Some Diseases of the Endocrine System"

Pinworms These small white worms, about a quarter of an inch long, may live in large numbers in the rectum Diagnosis can be made only on finding the worms or their eggs in the stools

Diarrhea, or frequent watery bowel movements, is a symptom of irritation of the intestinal mucous membrane This irritation may be due to excessive fat or sugar in the diet, to eating spoiled foods, to invasion of the mucous membrane by microorganisms, or to malignant disease or tuberculosis

*Treatment* depends upon the cause of the diarrhea If it is due to spoiled or indigestible food, the physician orders prompt cleaning of the bowel with purgatives and enemas In the more serious forms of diarrhea, violent catharsis is, however, contraindicated A very serious form of diarrhea known as dysentery, may be due to infection of the bowel by bacteria or to invasion by amebae—microscopic forms of animal life The diagnosis of these conditions is made by examining the bowel movements

If infection is present it may be cleared up by the use of antibacterial drugs. Adequate quantities of liquids are given to assure hydration. Nourishment is maintained at a proper level.

The patient should have bed rest during the acute stages. He should be isolated until the possibility of communicable disease is ruled out. Constipating medication may be administered. Hygienic measures, especially handwashing after using the toilet, are emphasized.

Constipation is not a disease but a symptom. In its chronic form it is, however, the basis of much digestive disturbance and possibly other illnesses. "Bilious attacks" are usually due to constipation rather than to trouble with the liver. This type of constipation is usually caused by poor food habits, although too little exercise and bad habits of elimination are important factors. Since certain diseases, such as cancer of the bowels, may be the cause of constipation, the presence of disease should first be ruled out by physical examination before dietary treatment is undertaken.

## *SUMMARY*

The common diseases of the gastrointestinal tract described in this chapter include: abnormalities of the tongue, acute indigestion, chronic indigestion, ulcers of the stomach, food poisoning, intestinal obstruction, hernia, tapeworm, appendicitis, peritonitis, colitis, jaundice, acute infectious hepatitis, inflammation of the gallbladder, cholecystitis, cholelithiasis, cirrhosis of the liver, and pinworms. (Reference to other chapters is made for discussions of chemical poisoning, cancer of the liver, diabetes, and typhoid fever.)

The gastrointestinal tract has to meet a great many hazards. Foodstuffs of every kind enter the system and, to be absorbed, must be changed into suitable materials. Microorganisms attack it. The ferments designed for digestion are capable of destroying the organs with which they are associated. Abnormalities of various kinds develop at every possible site along its entire length. Foreign bodies are introduced into it. And, finally, mental states, such as anxiety, have a profound and disturbing influence on the functioning of the system.

The range of symptoms for such a large number of disorders is

comparatively small, comprising difficulty in swallowing, lack or loss of appetite, nausea, vomiting, vomiting of blood, darkening of blood by pigment, constipation, diarrhea, and abdominal pain Therefore, although a correct diagnosis can generally be made, it is not easy to make The symptoms must be described exactly, including such details as the way the discomfort started, the duration of the symptoms, the frequency with which a symptom reoccurs, and its relation to meals

Since abnormal conditions in the digestive system are common, it is fortunate that so much help can be extended With modern instruments, particularly the endoscope, much of the tract can be seen Laboratory techniques are of great assistance Strict enforcement of diet and bed rest during acute stages of digestive disorders are important aspects of nursing care

## Questions

1 What changes in health are reflected in the condition of the tongue?
2 Why should patients with diseased hearts never overeat?
3 To what is chronic indigestion often due?
4 What complication is pretty sure to develop if an ulcer perforates the stomach? What is the best treatment of ulcers?
5 What discomforts and disorders are caused by food poisoning?
6 Discuss intestinal obstruction What is meant by *intussusception*?
7 What is a hernia? What device may help? What will cure it?
8 What is the treatment for tapeworm? Discuss whether or not this treatment will afford a permanent cure
9 What disease is likely to occur if the appendix is ruptured?
10 What treatment of appendicitis is generally recommended?
11 What are the symptoms of appendicitis? Name two measures which should be avoided when these symptoms appear
12 What is the cause of peritonitis?
13 What are the symptoms of colitis?
14 With what secretion is jaundice associated?
15 What are three conditions which cause disturbance in the elimination of bile?
16 What is the cause of acute infectious hepatitis?
17 What is the most effective treatment for this disease?
18 After repeated attacks of inflammation of the gallbladder what treatment may be necessary?

19. How do stones happen to form in the gallbladder?
20. Where are the bacteria often found that cause the infection?
21. Discuss cirrhosis of the liver.
22. What is the most serious disease of the pancreas?
23. If pinworms are suspected of being present, how is diagnosis made?
24. Upon what does the treatment of diarrhea depend?
25. What is the name of a very serious form of diarrhea? How is it diagnosed?
26. Why should a physician examine a patient with chronic constipation before dietary treatment is undertaken?

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# SOME INFECTIONS OF THE RESPIRATORY SYSTEM

The great majority of respiratory diseases are due to infection of the tract by germs that gain entrance to it in the air we breathe or in food or other substances introduced into the mouth. Most of these infections are caused by viruses. When the resistance is lowered by virus infection, a bacterial infection may become superimposed. Sometimes the germs lodge and multiply in the upper parts of the respiratory tract: the nose, throat, sinuses, or larynx. (See Chap. 11, "The Respiratory System.") Sometimes they penetrate at once to the lower parts and invade the trachea, bronchi, or lungs. Therefore, the respiratory infections may be divided into two main groups: upper respiratory infections and lower respiratory infections.

## *UPPER RESPIRATORY INFECTIONS*

Diseases of the upper respiratory tract include acute coryza (cold in the head), sinusitis, pharyngitis (sore throat), laryngitis, and croup. Although these terms are used to indicate the region in which the infection is most active, the infection is seldom limited to

that area alone. Usually the mucous membrane in the neighborhood is also involved, though less severely. One seldom has a cold in his nose without some infection of the pharynx or sinuses, and sore throat is usually accompanied by more or less hoarseness due to extension of the infection to the larynx. Since it is simpler, however, to describe symptoms and treatment according to the site of the greatest inflammation, upper respiratory infections are described under various names.

Coryza. This is the ordinary cold in the head, the symptoms of which everyone knows by experience. It is caused by infection of the mucous membrane of the nose, and is important because it is the starting point for so many and more serious respiratory infections: sinusitis, pharyngitis, otitis media (middle-ear abscess), and even bronchitis and pneumonia. Coryza is therefore worthy of more intelligent care than is usually given it, but since people do not feel sick in its early stages, it is impossible to get them to take it seriously, and they go about as usual, passing the "cold" on to many others. If patients could be persuaded to stay in bed for 24 hours when they "feel a cold coming on," the vast majority of colds would amount to very little, and the patients would not give their colds to other people as they do.

From the nurse's point of view, the most important thing to remember about acute coryza is that no person having a cold should be allowed in the room of a sick or convalescing patient nor should the visitor touch anything that the patient will touch, such as dishes, food, books, papers, or letters. Medication is not necessary except for patients who are prone to get secondary sinus infections and nasal obstruction. For them, the physician may order simple nose sprays or nose drops containing ephedrine or one of the related chemical substances; oily drops should not be used.

Pharyngitis, or sore throat, often follows or accompanies coryza. Its symptoms are too well known to need description. If the infection happens to involve the tonsils severely, the condition is known as *tonsillitis,* though that does not mean pharyngitis is not also present. If the infection causes pus to form behind the tonsil the condition is called "peritonsillar abscess" or "quinsy sore throat." Although pharyngitis and sore throat are such common diseases, there was no entirely satisfactory treatment of them until the introduction of the antibiotics, and the sulfa drugs. Rest in bed and warm gargles of

normal saline solution * are prescribed Dietary restrictions are not necessary, but sufficient fluid should be taken to keep the mucous membrane moist

It should always be borne in mind that the patient with severe sore throat should be seen by a physician as soon as possible, because acute throat infection may be due to diphtheria The presence of a gray membrane on the throat or tonsils will point to the advisability of taking a culture or specimen to discover the presence of this disease

Sore throat, stiffness of the neck, high temperature, diarrhea, and other symptoms are sometimes confused with the onset of a cold, but poliomyelitis (infantile paralysis) may be the disease the patient has, therefore, the nurse, especially in the summer months, should suspect this disease and report to the physician

Acute sore throat or tonsillitis is sometimes the starting point of acute rheumatic fever or acute rheumatoid arthritis, but in general it is a benign, or mild, infection The patient should remain in bed for 24 hours after the fever subsides However, those who have no fever will usually refuse to stay in bed Joint pains, earache, or unremitting fever call for the advice of a physician

Laryngitis means inflammation of the vocal cords with a resulting hoarseness It rarely occurs alone and is usually a complication of a "cold" or "sore throat" It is annoying, sometimes moderately painful, but usually does not make the patient feel sick

*The treatment* consists in avoiding cold air, talking as little as possible, and inhaling vapor from the steam inhalator, often medicated with benzoin Cough drops containing menthol or chloroform often give relief

Croup is a term applied to a spasm of the vocal cords, which may occur during the course of an upper respiratory infection It is an alarming condition, more common in children than adults It usually occurs at night, probably because the windows are opened in the patient's room, letting in cold air The child awakens with a hoarse, metallic cough and has such great difficulty in breathing that he seems to be strangling This he never does, if he has simple uncomplicated croup

* Normal saline solution may be made up for a gargle by using 1 level dessert spoonful of table salt to 1 qt of water, or a smaller amount by using 1 level teaspoonful of table salt to 1 pt of water

*Treatment* of an attack consists in getting the child into a very warm room, in getting him to inhale vapor from the steam inhalator, if that can be done, and in sending for a physician immediately. The reason for calling a doctor at once is that *many children who are said to have croup really have laryngeal diphtheria* and may strangle if much time is wasted treating them for croup. When the possibility of diphtheria has been ruled out, the attacks of croup can largely be prevented by having the patient sleep in a room that is really warm and by the use of steam inhalations. (See Chap. 35, "Administration of Medicines," and Chap. 39, "Care of the Sick Child.")

## *LOWER RESPIRATORY INFECTIONS*

Diseases of the lower respiratory tract are, as a rule, more serious than those involving the nose and throat. As in diseases of the upper tract, those of the lower tract are frequently not clearly separated. A patient may have bronchitis and asthma at the same time, and probably everyone who has pneumonia also has bronchitis, although the latter is masked by the more serious disease.

**Bronchitis** may be either acute or chronic. The acute form usually follows a "cold" or "sore throat" and is due to an extension of infection to the mucous membrane lining the bronchi and their branches.

The *symptoms* of acute bronchitis are: fever, cough with sputum, a feeling of tightness and soreness in the chest, loss of appetite, and general weakness. The duration of the disease is variable, depending on the patient's age and strength. Usually the fever ceases after two or three days, following which the cough begins to grow less severe, and the patient begins to feel much better. Sometimes, especially in older people, the bronchitis does not subside but progresses into bronchopneumonia. In elderly patients also, the bronchitis may not completely disappear, but may persist as the chronic form without making the patient particularly sick, and causes a continuing cough with sputum.

*Treatment*. Rest in bed in a warm room and the administration of aspirin will make the patient more comfortable in the early course of the infection. Codeine is the best drug for cough, and is added to the usual expectorants. Antibiotics, although having no effect on

the virus of the infection, will often be administered to prevent secondary bacterial invasion, especially in the aged and weak

Bronchopneumonia is caused by the extension of an acute bronchitis into the lung tissue so that the alveoli become involved in the infection The symptoms do not differ greatly from those of severe bronchitis, but the patient is usually sicker Bronchopneumonia is more common in children and elderly people than in people of middle life It is a fatal disease in babies and elderly or frail individuals because it often lasts several weeks and exhausts the patient As it is usually preceded by bronchitis, its onset is often masked by that condition

Fever persists, and shows a daily swing, up and down Cough and the raising of sputum continue, but the patient is generally more toxic Physical examination of the chest may reveal the nature of the process, an x-ray always will Determining the course which this form of pneumonia will take has been improved by the discovery of the antibiotic drugs, especially penicillin

Lobar pneumonia is quite different from bronchopneumonia It does not, as a rule, result from the extension of some other respiratory infection, but comes on suddenly, "out of a clear sky," and is due to invasion of the lung tissue by germs known as pneumococci It often begins with a chill, sharp pain in the chest, and a dry painful cough The temperature rises sharply, the pulse becomes rapid, the breathing becomes quick and shallow, and in a few hours the patient may be very sick Soon the cough becomes productive, that is, the patient raises sputum, which is generally reddish or brownish, because of the presence of blood

Lobar pneumonia attacks the apparently well as often as the weak The temperature is high and unremitting, prostration is great Previous to the advent of the antibiotic drugs, a death rate of 25 per cent was the rule in the untreated patients Since the use of these drugs the rate has fallen to about 5 per cent Penicillin is the most effective drug for this disease although in the unusual case which shows no response to penicillin others drugs are sometimes necessary (e g , streptomycin)

Complications such as empyema (pus in the pleural cavity), lung abscess and endocarditis (involvement of the heart) are uncommon when the antibiotics are administered

Virus pneumonia. A third form of pneumonia has been recognized in recent years. It is referred to as "primary atypical pneumonia." Evidence is accumulating that one or more viruses may produce this disease. It differs from lobar pneumonia in that the patient is less ill, but has a distressing cough productive of bloodless sputum. The fever is not so high, but may last from 7 to 11 days. Death is unusual. The only antibiotic drug that has a definite effect on virus pneumonia is aureomycin (chlortetracycline hydrochloride). When this drug is used, the fever may be arrested within 48 hours.

*Nursing care in pneumonia.* The practical nurse should not assume the complete responsibility for an acutely ill patient; but she may frequently assist with the care of such patients under the supervision of a professional nurse.

In pneumonia the fundamental purpose of nursing care is to conserve the patient's strength and promote his comfort. Careful attention to details and avoidance of unnecessary disturbance mark the efficient nurse. Most patients with pneumonia are more comfortable if the head and shoulders are elevated with pillows, but, if the patient is more comfortable when he lies flat, he should be allowed to do so. If the elevated position is preferred, a pillow under the knees will help maintain that position. As soon as he is able, the patient should be urged to turn on either side at intervals. The skin must, of course, be kept clean, and the mouth cleansed frequently. The diet should be simple and easily digestible. Fluids adequate to keep the mucous membranes moist should be given. Daily regularity of the bowels should be established. The air in the patient's room should be fresh, but not cold. Sleep is important and the patient should not be awakened unnecessarily.

## *ALLERGY OF THE RESPIRATORY SYSTEM*

Certain individuals are capable of developing a high degree of sensitiveness (hypersensitivity) to substances called *allergens,* which may be introduced into the body by breathing (inhalation), eating and drinking (ingestion), or by injection. Such people are described as "allergic." An allergic individual is one who reacts abnormally to contacts with proteins, so that substances which do not irritate a

normal person may set up a reaction in one or more systems of the body of the sensitive individual To a certain extent, this "allergic" condition is inherited

**Hay fever.** The commonest manifestation of allergy is hay fever This condition is caused by pollens in the air, which are inhaled In an allergic individual, only minute quantities of the offending substance are necessary to set up a reaction In hay fever the mucous membrane of the nose may become markedly swollen, accompanied by a mild irritation of the eyes Most hay fever is seasonal, caused by the pollens from grasses and ragweed

A large group of drugs known as the *antihistamines* may be taken internally, and give marked benefit to most patients with hay fever Locally, nosedrops containing ephedrine or related compounds are helpful When the nature of the offending substance is known, the patient's sensitivity to it may be lowered by a preseasonal injection of minute quantities of the substance

**Bronchial asthma.** When the allergic sensitivity involves the mucous membrane of the bronchial tubes, the patient is said to have asthma Swelling of the mucous membrane occurs, narrowing the airways, so that difficulty in breathing is produced Inspiration and expiration become labored and prolonged, and in severe cases the patient may have a struggle to get enough air to breathe Pollens frequently cause this condition Foods and a miscellaneous group of other substances, including orris root, house dust, horse serum, and animal hair, may be the cause of the disturbance It is often difficult to identify the substance causing the asthmatic attacks in any particular individual The cause, however, can be determined by the physician when he learns the circumstances under which the attacks occur, and when he makes tests on the skin to detect whether or not the suspected substance produces a reaction

If the irritating substance can be identified, and if the patient can avoid it, the asthmatic attacks will not occur, and no other treatment is needed If the irritating substance cannot be avoided, the attacks can sometimes be prevented, as they are for hay fever, by decreasing the patient's sensitivity by hypodermic injections of small amounts of the irritating substance If the irritating substance cannot be identified, the only treatment left is the treatment of the attacks

Certain drugs will relieve an attack, but will not prevent another one Sometimes change of climate eliminates the attacks If the

irritating substance is one which is suspended in the air, the patient can often obtain relief by staying in an air-conditioned room. Severe asthma is an extremely distressing and alarming condition, but is only rarely fatal. The physician usually treats the asthmatic attack by ordering the administration of drugs which dilate the bronchi, such as ephedrine, epinephrine, and aminophyllin; and expectorants, such as ammonium chloride or iodide, which help thin out the bronchial secretions, making them easier to expectorate. More recently ACTH and cortisone have been found at least of temporary benefit for severe cases which do not respond to the usual management. These hormones act to prevent the reaction between the offending substance (allergen) and the hypersensitive tissues of the patient. Unfortunately, these agents have widespread metabolic effects on other systems of the body, which make their prolonged administration inadvisable; therefore frequent checkups with the physician are necessary.

Two conditions which resemble allergic asthma must be mentioned. One is *cardiac asthma,* due to heart failure, in which the dyspnea is so severe as to resemble allergic asthma. The other is *chronic bronchitis,* usually due to infection, in which there is enough swelling of the bronchial mucous membranes and spasm of the bronchial muscles to cause a wheezing type of dyspnea (expiration).

### HEMORRHAGE

The expectoration of pure blood or of grossly bloody sputum should be considered as hemorrhage. Death from hemorrhage is rare, even in tuberculosis. However, at the first sign of bleeding, a physician should be called. The patient should be in bed in a comfortable position. Neither a hot nor a cold drink should be given, as either may result in further bleeding.

## *SUMMARY*

The diseases of the respiratory system are generally caused by infection from viruses which enter the body in the air breathed or in the food eaten. Lowered resistance may result in further infection by bacteria.

The diseases of this system are divided into upper and lower respiratory infections However, very often infection passes from the upper to the lower areas, and more than one morbid condition of the system may exist at the same time

Since some infections are far more dangerous than others, it is important that any patient with an acute respiratory condition be seen by his physician without delay, postponement might prove fatal

As long as the condition remains acute or serious, nursing care should be the responsibility of the professional nurse, but in convalescence the practical nurse may be on duty Great care should be taken to avoid the spread of infection Doctor's orders are to be carried out faithfully The patient should drink plenty of fluids and be guarded against exposure to cold, and damp air

## Questions

1 What is the cause of most respiratory diseases?
2 Into what two groups are respiratory diseases usually divided?
3 What organs are included in each of these groups?
4 What is the ordinary name for *coryza*?
5 Why should a patient with an acute respiratory infection be seen by the doctor as soon as possible?
6 When is a patient considered "allergic"? Name a common manifestation of allergy
7 What is the purpose of most drugs given to relieve asthma?
8 What is the fundamental purpose of nursing care in pneumonia?
9 Consult the Glossary for the meaning of the following acute, asphyxia, aspiration, chronic, dys , -itis, percussion, smear

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# COMMON DISEASES OF THE URINARY TRACT

## *INFECTIONS OF THE URETHRA* *

Gonorrhea is a venereal disease, as it is contracted by direct sexual contact with an individual, either male or female, who is infected with gonoecoci. After the usual incubation period of about four days, there is an acute inflammation of the urethra called urethritis, with a purulent, urethral discharge and burning on urination. These symptoms are more pronounced in males. The diagnosis is commonly made from the history and from a stained smear of the discharge, which shows many pus cells containing the infecting bacteria—the gonococci. Care must be taken that none of the discharge gets into the eyes from the fingers, as it causes a very severe inflammation. Injections of penicillin are effective in treating gonorrhea.

Males sometimes have an inflammation of the urethra which is not due to gonococci, which is called *nonspecific urethritis*. However, this may be infectious in sexual intercourse. It is often hard to cure even by penicillin or other powerful drugs, as well as by local treatments.

* See also Chap. 12, "The Urinary Tract"

Cystitis means inflammation of the bladder, and gives the symptoms of frequent and urgent urination, often burning, and sometimes blood in the urine

Inflammation of the bladder is caused by bacterial infection, the colon bacillus being the most common infector Infection may come down to the bladder from the kidneys, or it may arise as a contaminating infection from a catheterization or instrumentation where aseptic technique was not maintained In many instances the cause of infection is not clear Cystitis is apt to be present in tuberculosis of the kidney (which will be discussed later)

Any condition which irritates the bladder will also produce the symptoms of cystitis Such conditions are stones or tumors in the bladder, or disease of the prostate gland in men These conditions predispose to the occurrence of infection, so that they are frequently found together

If an infection of the bladder without any other complications is found, this infection can usually be cleared up without very much difficulty by drugs which act as urinary antiseptics However, in the presence of complicating factors, such as stone, tumor of the bladder, or prostatic obstruction, it is usually impossible to cure a bladder infection with even the strongest drugs until these complicating factors have been removed

*Treatment* The treatment of cystitis is the use of drugs to cure the infection causing the inflammation Any complicating factors such as stone, tumor, or prostatic obstruction will first have to be eliminated, as already mentioned Bladder irrigations or instillations of drugs are seldom employed today It is felt that the best way of irrigating the bladder is to have the patient take plenty of fluids so that a good flow of urine is maintained through the bladder, which is emptied frequently Sedative drugs which make the bladder less sensitive and active are frequently ordered for symptomatic relief and comfort

Tumors of the bladder may be cancerous or precancerous Their most common first sign is the appearance of blood in the urine, often painless Large bladder tumors usually give cystitis symptoms (frequency and urgency) and may cause burning and pain

**Prostate obstruction (benign and malignant).** In many elderly men, the prostate gland enlarges and presses on the urethra at the bladder neck and interferes with urination, making the urinary

stream slow to start, small, feeble, and dribbling. The bladder cannot be emptied completely and there always remains some residual urine in the bladder, even immediately after voiding. Gradually the difficulty in voiding gets worse, the amount of urine retained in the bladder increases, and eventually the patient cannot void at all, and has a bladder painfully distended with urine. This is called *acute urinary retention*. When this happens, the urine is drawn off by a catheter which is left in the bladder to give constant drainage. When the patient is rested and has been prepared, an operation to remove all or part of the obstructing prostatic tissue is performed.

## INLYING BLADDER CATHETERS *

In certain instances where the patient cannot void on account of some disease condition, or where the patient's physical condition or age contraindicates a prostate operation, or where the patient is dribbling urine constantly, the physician inserts an inlying or indwelling catheter. For this purpose a Foley-type soft-rubber catheter, size 14, 16, or 18 French, is used with 5 to 6 cc of fluid in the bag. Usually gravity drainage is sufficient, the urine being conducted from the catheter by sterile glass and rubber tubing to a large bottle on the floor, into which it drains by gravity. Care should be taken to wash out the bottle daily, and also to see that the end of the rubber tubing does not touch the urine in the bottle. Again, as in the treatment of cystitis, the catheter is not irrigated, except by the patient's own urine flowing through it. The patient may be given a mild urinary antiseptic. In some patients urinary crystals accumulate rapidly and plug inlying catheters so that they have to be changed often—perhaps once every ten days or two weeks. In other patients, the catheters do not tend to get plugged. In such cases it is quite all right to leave the same catheter in place as long as it is draining satisfactorily. The actual length of time is left to the discretion of the physician. In certain instances, caused either by disease or by injury to the spinal cord, it is felt that tidal drainage is preferable to the plain gravity type.

* Harmer, Bertha, and Henderson, Virginia: *Textbook of the Principles and Practice of Nursing*, 5th ed. The Macmillan Company, New York, 1955, pp. 875-83

## *SOME DISEASES OF THE KIDNEY*

Tuberculosis is an infection which sometimes affects one kidney (rarely both) Tuberculosis is less common than it was, but unfortunately it is not yet rare Surprisingly enough the first and most distressing symptoms of renal tuberculosis are bladder symptoms, consisting of frequency, urgency, burning urination, and pain in the bladder The infected kidney is 'silent," but the urine from it causes a painful inflammation of the bladder Although the urine contains blood and pus, it frequently shows no infection when examined in the usual manner under the microscope If the tuberculosis infection is very slight and discovered early, it is possible that it may be cured by the newer drugs, and by rest in a sanatorium However, if the disease has passed the early stage and has become established and ulcerating, it probably cannot be cured by drugs Surgical removal of the affected kidney—if the other kidney can be shown to be uninfected, which is usually the case—will be necessary for a cure Although it is felt that tuberculosis of the urinary tract always comes from tuberculosis elsewhere in the body, as in the lungs or the bones, frequently these primary lesions have healed, and the source is unknown

Kidney tumors are practically all malignant Their most common sign is gross painless discharge of urine containing blood Sometimes there is some pain in the affected kidney Often a mass can be felt in the kidney region The only treatment is surgical removal Usually this is possible, but sometimes, although the kidney can be removed, irremovable metastases are discovered (*Metastases* are small masses of cancerous material which have been transferred from other parts of the body )

Renal calculi, or kidney stones, occur under conditions where there is constantly present in the urine a superabundance of the materials, such as uric acid or calcium phosphate, of which stones are formed

Calculi, or stones, vary in size all the way from that of a BB shot or smaller, to huge "stag horn' calculi, which fill the entire kidney pelvis Surprisingly enough, the large stag-horn calculi frequently give no symptoms

In a different class are the smaller stones, which may obstruct and prevent the urine from getting out of the kidney pelvis into the ureter, or may plug the ureter. In such instances, there is severe kidney colic, often a high fever, and the situation is an emergency requiring immediate release of the trapped urine by removing the stone either surgically or cystoscopically and thus securing temporary urinary drainage. The removal of a stone is only part of the problem, as the underlying cause of the stone (metabolic, dietary, etc.) should be determined and corrected in order to prevent the formation of more stones.

Nepbritis. Although this disease has been divided into several types which are caused by different changes in the kidney, they are all alike in their most important effect, which is damage to the kidney tissue. This damage results in the inability of the kidney to carry on its twofold task: (1) of eliminating waste products normally excreted in the urine; (2) of saving certain elements in the blood, the loss of which might also cause sickness. Thus the kidney normally acts as a filter which allows undesirable products to leave the body but which also saves substances which are essential for normal body function.

Glomerulonephritis. This type of nephritis is caused by a little-known process which follows an infectious disease, most commonly a sore throat. It is most often seen in children. The symptoms consist of drowsiness, listlessness, vomiting, and the swelling of the eyelids, face, and ankles, in association with a scanty amount of urine which may be dark and smoky-appearing due to the presence of large numbers of blood cells.

*The treatment* consists principally of rest, a diet which relieves the kidneys of as much work as possible, and care of the symptoms as they develop. The nurse should keep an accurate account of the fluid intake and the urine output each 24 hours, and of any change she may observe in the character of the urine.

The great majority of children with this acute form of the disease will experience complete recovery in the course of a few weeks.

Pyelitis. This type of nephritis is caused by bacteria which reach the kidney either by way of the blood stream or by extension upward from the bladder. Tiny abscesses appear in the substance of the kidney, which may heal leaving small scars. Single episodes of this process do not seriously affect kidney function, but recurrent and

oft-repeated episodes may destroy enough kidney substance to interfere seriously with the functions of the kidney

This disease is frequently seen in patients who are pregnant, in patients with diabetes, and in patients who have an obstruction to the free flow of urine from the kidneys In most instances the process is acute and readily apparent Treatment is usually effective

*The signs and symptoms* consist of fever, chills, pain in the back over the kidney area, a burning sensation during urination, and a desire to urinate frequently Tenderness may be found over the kidney area when one presses there

In some cases, however, the symptoms may be of such a mild nature that medical attention is not sought In these instances repeated attacks may be experienced, resulting in advanced damage without the patient's being aware that anything is wrong

*The treatment* consists of bed rest, large amounts of fluids to keep the urine flow large, and antibiotic drugs to dispose of the bacterial infection

**Vascular nephritis** This is the third type of nephritis commonly seen and is caused by sclerosis or hardening and narrowing of the blood vessels which supply the kidney When the blood vessels become thickened in this way, the supply of blood to the kidney is diminished so that gradually the kidney loses substance and becomes shrunken

There are no symptoms referable to this process, since it is a gradual and very slowly progressive process lasting over the course of many years It is diagnosed by the knowledge of the presence of high blood pressure as well as by the finding of a similar process in arteries elsewhere in the body

*The treatment is aimed at lowering the blood pressure by whatever means seem appropriate*

## *SUMMARY OF GENERAL NURSING CARE*

The first essential of nursing care is to provide complete bed rest, in a pleasant, comfortable environment, as free as possible from worry The patient will appreciate an interview with his doctor, and a talk with his pastor or confidential friend

Persistent nursing care is essential The bowel movements may

have to be kept loose by mineral oil or saline enemas, as ordered. Daily baths are needed; warm baths afford much comfort and relief. The diet is generally restricted in salt and may consist largely of fats and carbohydrates. The amount of protein will be prescribed.

The temperature of the room is normal, but warm covers and a flannel gown are often welcome. Drafts and chilling are to be avoided.

If the patient has edema or is losing weight, particular care must be taken to prevent pressure sores (*decubiti*).

Specimens of urine should be collected and kept as ordered, for laboratory analyses. The patient should be encouraged to cooperate fully in the accurate measurement of intake and output of liquids. Records should be maintained conscientiously.

## Questions

1. How is gonorrhea usually contracted?
2. How long is the average incubation period of gonorrhea?
3. What three symptoms of gonorrhea appear thereafter?
4. What particular care must both the patient and the nurse take?
5. What drug has been found effective in treatment of this disease?
6. What are the symptoms of cystitis?
7. What is the most common cause of infection in inflammation of the bladder?
8. Name two or three ways in which such an infection may arise.
9. Name some common complications which may be present in cystitis.
10. What is considered the best way for the bladder to be irrigated in the case of cystitis?
11. Discuss tumors of the bladder.
12. What is the effect on the urine in patients suffering from prostatic obstruction?
13. Under what conditions is an inlying catheter employed?
14. What is usually the first symptom of tuberculosis of the kidney?
15. If this disease is well established, what treatment is usually indicated?
16. Are most kidney tumors benign or malignant?
17. What is the only satisfactory treatment for kidney tumors?
18. What conditions are constantly present when renal calculi occur?
19. What may be the relation between the excessive drinking of milk and the formation of calculi? Explain.

20. What would be the result if an obstructing stone were not removed?
21. What is the general effect of any of the several types of nephritis?
22. What are the symptoms of glomerulonephritis? In whom does this disease most frequently occur?
23. What are the signs and symptoms of pyelitis?
24. Discuss the treatment of this disease.
25. Discuss the causes of vascular nephritis. What are its symptoms? How is it diagnosed?

# 48

# SOME DISEASES OF THE REPRODUCTIVE SYSTEM

## *SOME DISEASES OF THE FEMALE REPRODUCTIVE SYSTEM*

Abnormalities resulting from lacerations during childbirth. During delivery the cervix, vagina, and perineum of the mother may become torn. If these tears are not repaired, the bladder and rectum may lose their proper supports and sag, thereby causing constipation and difficulty in holding the urine. Lacerations in the cervix sometimes predispose it to cancer (*carcinoma*).

Irregular menstruation. Any irregularity of menstruation, particularly bleeding between periods, should be brought to the attention of a physician, as this may be a sign of serious trouble.

Infection of the tubes. A good deal of invalidism in women is the result of infection of the Fallopian tubes and surrounding tissues. Such infection may be caused by the gonococcus, or by the tubercle bacillus.

Lumps in the breasts. Any lump in the breast should be shown to a physician, as it may be the beginning of carcinoma.

## COMPLICATIONS OF PREGNANCY

**Varicose veins and edema.** Frequently the pregnant uterus presses on the large veins in the pelvis and abdomen, thus causing a resistance to the flow of blood from the legs back to the heart. This may result in varicose veins or in edema. Edema, popularly known as dropsy, is an accumulation of body fluid in the tissues.

**Nervous system changes.** During pregnancy some women may show changes in their dispositions. They may become irritable or crave unusual things to eat. Rarely, they may become mentally disturbed.

**Toxemia.** A condition may arise during pregnancy the exact cause of which is at present unknown. It is associated with high blood pressure and changes in the kidneys. If it is not checked, convulsions may occur. This condition is known as toxemia of pregnancy, or eclampsia, and is a very serious complication, sometimes leading to death. The best treatment is prevention. Careful cooperation with the doctor on diet will lead to maximum safety for the patient. Foods high in table salt should be limited. Most obstetricians favor a high-protein, high bulk, low-salt, low-fat, and low-carbohydrate diet.

**Miscarriage.** Occasionally the products of conception (that is, embryo, placenta, and membranes) may be cast off from the uterus before the pregnancy is complete. This is called a miscarriage (or abortion, if it occurs in the first four months). If the embryo, placenta, and membranes are completely cast off, the miscarriage is called complete, but if portions of them remain within the uterus, it is called incomplete. In an incomplete abortion or miscarriage, bleeding from the uterus continues until all of its contents are expelled. Complete clearing may have to be done surgically. It is therefore important in a miscarriage to save everything passed by the patient for the doctor's inspection.

**Tubal pregnancy.** Occasionally the ovum implants itself in the wall of the Fallopian tube instead of in the wall of the uterus. As the embryo grows, the tube is stretched and ultimately breaks, thus causing severe bleeding into the abdominal cavity. If the ruptured tube is not removed, the patient may bleed to death.

**Vaginal bleeding.** Any bleeding from the vagina in the last three or four months should be reported at once to the patient's doctor, for it may mean miscarriage, premature labor, or a separation of the placenta from the wall of the uterus.

## COMPLICATIONS OF THE PUERPERIUM

**Puerperal fever.** This is due to infection which usually begins in the uterus and spreads through the body, often resulting in a serious septicemia (infection of the blood). Puerperal fever is less likely to occur if proper care is taken during delivery and during the puerperium to guard against infection.

**Local infection of the uterus.** This will be evidenced by foul-smelling lochia.

**Postpartum hemorrhage.** This means hemorrhage following the birth of the baby. It may occur immediately after delivery or any time during the early weeks of the puerperium and is a very serious emergency requiring prompt action on the part of the physician. The sign of hemorrhage is excessive flow of blood. While waiting for the physician, the patient should be placed in bed; if shock is present, it may be necessary to elevate the foot of the bed.

**Mastitis.** The symptoms are a tender area in the breast, usually with a considerable degree of redness over this area. Elsewhere, there may be caking and lumping of the breast. If this is evident, the baby should be withheld from feeding on that breast and the condition reported to the physician at once.

**Urinary tract infection.** The symptoms are frequency, burning on urination, tenderness in the lower mid-abdomen, and tenderness near the angle formed by the ribs and the vertebrae. It should be reported without delay.

Phlebitis is discussed in Chapter 44, "Some Diseases of the Circulatory System." The symptoms are pain and tenderness in the leg, often a red spot over a vein. The part must be kept quiet and never rubbed, even if requested by the patient. The reason for refusing the request should be explained to the patient, and the symptoms should be reported to the physician.

In any of the above complications, the attending physician should be notified at the earliest possible moment.

## *SOME DISEASES OF THE MALE REPRODUCTIVE SYSTEM*

Undescended testis is a condition where the testis fails to descend into the scrotum, but remains either in the groin or, rarely, inside the abdomen. Usually it affects only one testis, but occasionally both. It has been found that undescended testes do not manufacture spermatozoa, so that it is important for the testes to be in the scrotum before puberty. Endocrine therapy is often instituted, though in rare instances surgery is necessary to place them in normal position.

Tumors of the testis tend to occur between the ages of 25 and 40, and usually arise as a painless swelling of a testis. These tumors are often discovered accidentally. They are usually quite malignant and are the most common cause of a painless enlargement of the testis. Such an enlargement merits immediate surgical removal.

Hydrocele is an accumulation of fluid between the tissue layers surrounding the testis. This benign condition is uncommon but is found more often in middle aged men. The hydrocele may be treated by draining it with a large bore needle whenever it gets large enough to become bothersome. As a rule the fluid slowly reaccumulates.

Prostatitis. The prostate may become infected from infection elsewhere in the urinary tract, from instrumentation or inlying catheters, or from the extraction of abscessed teeth. This condition is called prostatitis and is treated by antibiotic drugs and massage of the prostate.

In elderly men the prostate frequently grows and obstructs the outlet of the bladder, making urination increasingly difficult and eventually impossible. It may be months or even years after the first symptoms before urination is finally cut off. Frequent and urgent urination, especially at night, is a prominent symptom. Prostatic obstruction necessitates surgery for its relief, either complete surgical removal of the prostate or, in some instances, cutting away the obstructing portion of the prostate by an instrument introduced through the urethra.

Carcinoma of the prostate is quite common and perhaps from 15 to 20 per cent of cases of prostatic obstruction are due to this

cause. If the disease has not extended beyond the prostate, total surgical removal of the prostate and its capsule will effect a cure in a good many cases. Usually this disease does not show any symptoms different from those of benign prostatic obstruction.

## *SUMMARY*

The principle diseases of the female reproductive system are abnormalities resulting from lacerations during childbirth; irregularity in menstruation; infection of the Fallopian tubes, either by the tubercle bacillus or by the gonococcus; cancer of the breast; varicose veins and edema; rarely, mental disturbances during pregnancy; toxemia; miscarriage; tubal pregnancy; vaginal bleeding; puerperal fever; local infection of the uterus; postpartum hemorrhage; mastitis; urinary tract infection; and phlebitis. The physician should be called as soon as any of these complications appear. He should be given a careful description of the symptoms which have been observed.

Some diseases of the male reproductive system include undescended testis; tumors of the testis; hydrocele; infection of the prostate gland; obstruction of the prostate; and carcinoma of the prostate. In many of these diseases only surgery can effect a cure, although measures are sometimes effective. The physician should be consulted without delay if complications are in evidence.

### Questions

FEMALE

1. What abnormalities result from failure to repair tears during childbirth?
2. What are two probable causes of infection of the Fallopian tubes?
3. Why should the physician's attention be called to any lump in the breast?
4. What is a common cause of varicose veins during pregnancy?
5. What is another name for toxemia of pregnancy?
6. With what two conditions is this disease associated?
7. What diet is favored by the obstetrician to prevent the onset of toxemia of pregnancy?

8 What two names apply to a premature casting off of the contents of the uterus in pregnancy?
9 Why is it important to save all the material expelled from the uterus at this time?
10 What happens in tubal pregnancy?
11 What may be the significance of bleeding from the vagina in the last three or four months of pregnancy?
12 What may be the result of puerperal fever?
13 How can local infection of the uterus be detected?
14 While waiting for the doctor, what may be done to help the patient who has a postpartum hemorrhage?
15 What are the symptoms of mastitis?
16 What are the symptoms of infection of the urinary tract?
17 What attitude should the nurse take with the patient with phlebitis, if she is asked to rub the affected part?

MALE

18 What treatment may be necessary for an undescended testis?
19 Are tumors of the testis generally benign or malignant?
20 What are two common causes of an infected prostate gland?
21 What two treatments have been found effective for an infected prostate gland?
22 What is the only satisfactory treatment for the prostate gland when the urethra is obstructed?

# 49

# SOME DISEASES OF THE ENDOCRINE SYSTEM

Disturbances of the endocrine glands are chiefly manifested by changes in the functions and structures of these ductless glands. (See Chap. 14, "The Endocrine System.") Occasionally, when the cause of the disturbance is a tumor or an inflammation there may be pain or swelling in the gland itself. Many disorders of the thyroid, sex glands, and adrenal glands result from primary changes in the anterior pituitary gland functioning. Frequently it is impossible to determine the exact cause of the disturbed glandular function. As a rule, it is the disturbance of gland function rather than its cause that must be treated. These disturbances are usually described as *hyperfunctions*, meaning that the gland is secreting too actively, and as *hypofunctions*, meaning that there is deficient activity.

## *DISTURBANCES OF THE THYROID GLAND*

Overactivity of the thyroid gland (hyperthyroidism, thyrotoxicosis). Overactivity of the thyroid gland is practically always associated with enlargement of the gland, which is often visible as a goiter or swelling of the neck below the Adam's apple (prominentia laryngea). However, the presence of a goiter does not always mean that the gland is overactive, since many patients with an enlarged

thyroid have normal function The diagnosis of overactivity of the thyroid depends upon the presence of symptoms of excess thyroid hormone production and upon the results of certain special laboratory tests, such as the determination of the patient s basal metabolism rate (BMR) The BMR measures the rate at which the patient s body uses oxygen, compared to normal people of the same age, size, and sex In hyperthyroidism the BMR is usually considerably increased above normal

## DISTURBANCES OF THE THYROID GLAND

*Symptoms and signs* of hyperthyroidism commonly include nervousness and irritability, loss of weight, excessive perspiration, tremor of the hands, rapid heartbeat, and prominence of the eyeballs

*Treatment* of the disease depends upon many individual factors, which must be considered by the physician before he decides which method he will use Sometimes surgical removal of part or almost all of the gland is the best form of treatment Often prolonged treatment with certain antithyroid drugs will suppress the activity of the gland satisfactorily, other patients are given a small dose of radioactive iodine, which localizes in the thyroid gland and permanently reduces glandular activity by briefly giving off internal radiation

Hypothyroidism or deficient activity of the gland causes a slowing of all the body processes The result depends somewhat upon the age at which the deficiency begins and upon its gravity If it is present at birth in any considerable degree, it prevents the physical and mental growth of the baby This condition is known as *cretinism* If the thyroid deficiency does not develop until middle life or later, it produces a condition known as *myxedema* because the patient looks edematous though the swelling is not due to dropsy but to infiltration of the tissues with a waxy substance

CRETINISM (*CONGENITAL OR INFANTILE HYPOTHYROIDISM*) The symptoms of cretinism vary somewhat according to the severity of the deficiency The condition is usually not detected during the first weeks of life unless it is very severe The baby however, does not grow, though it may gain weight It usually is clumsy about nursing Its tongue is thick and protrudes from its mouth Its expressionless face looks old and, if the thyroid deficiency is severe the picture is that of a feeble minded dwarf Less severe deficiencies produce a

less typical picture, but it is always one of retarded progress, mental and physical.

ADULT MYXEDEMA has many symptoms similar to those of cretinism. They consist, in general, of a slowing of all activities. Patients avoid effort as much as possible, even the effort of thinking, and generally become lethargic. They gain weight, the skin becomes pale and waxy, the hair becomes coarse and dry and falls out. They complain of feeling cold, of their arms and legs "going to sleep," of inability to remember anything, and of being tired all the time. The temperature is usually subnormal. Patients with mild degrees of hypothyroidism may have few of these symptoms. To make the diagnosis, the doctor often must rely on the results of the BMR and other laboratory tests. In hypothyroidism the BMR is always significantly lower than normal.

*Treatment of thyroid deficiency* consists in giving the patient enough thyroid extract to compensate for the deficiency and bring the metabolism up to normal. When this is accomplished, great improvement takes place. As its extent is determined somewhat by the length of time the disturbance has existed untreated, it is particularly important in cretins to establish the diagnosis and begin treatment early. Thyroid extract is an extremely active substance capable of doing great harm as well as great good. Therefore, it should never be taken except by the advice, and under the supervision, of a physician. It is useless and dangerous in the reduction of obesity unless the obesity is caused by thyroid deficiency.

Simple goiter means enlargement of the thyroid without disturbance of function. It is common during adolescence, especially in so-called goiter districts.

Other forms of goiter are found in older people and are, as a rule, important only because they are unsightly. Any goiter in an adult is a possible source of trouble. Sometimes the enlargement is due to cancer.

## *DISTURBANCES OF THE PARATHYROID GLANDS*

Excessive production of parathyroid hormone (hyperparathyroidism) is usually caused by one or more small benign parathyroid tumors, often so embedded in the thyroid gland as to be scarcely

noticeable In this disease calcium is drawn out of the bones and appears in increased amounts in the blood and urine As a result, there is a tendency for stones of calcium and phosphate to form in the kidney and for the decalcified bones to become softened and cystic Removal of the parathyroid tumors lowers the calcium in the blood to normal and prevents further damage to the bones and the kidneys

Deficient secretion of parathyroid hormone (hypoparathyroidism) is usually the result of accidental removal of the parathyroids during operations on the thyroid gland In such cases the blood calcium is very low and often results in tetany This is a condition in which there are frequent uncontrollable twitchings and spasms of the muscles due to increased irritability of the nerves and muscles Tetany and hypoparathyroidism are effectively treated by the administration of large amounts of calcium and vitamin D

## *PITUITARY DISTURBANCES*

Disturbances of pituitary function produce a great variety of changes in the body The situation is very complicated because the pituitary controls so many different activities of the body and because the results of its disturbances depend considerably upon the age of the patient when such disturbances occur

Overactivity of the anterior pituitary gland is most often due to small tumors which may cause excessive growth (*gigantism*), premature or abnormal sexual development, or the peculiar condition called *acromegaly* In the latter disease there is grotesque coarsening of the facial features and very marked enlargement of the hands and feet Such conditions are most often treated by x-ray therapy to the head, or extremely rarely by surgical removal of the offending tumor tissue

Hypofunction of the anterior pituitary may also be caused by tumors of this gland, but it often develops in women following obstetrical hemorrhage When it develops in children, pituitary failure may result in stunted growth and decreased sexual development Often there are signs of reduced thyroid and adrenal function as well because, as noted above, the anterior pituitary normally regulates the activity of these other glands

Diabetes insipidus, a very unusual disease, develops when there is deficient posterior pituitary function. Because they have lost their ability to control the formation of urine, patients afflicted with this condition pass excessive quantities of urine. Such patients may void two or three gallons of urine daily and avidly consume equal quantities of water in an attempt to slake their continual thirst. Diabetes insipidus is effectively controlled by frequent administration of posterior pituitary hormone.

## *ADRENAL GLAND DISTURBANCES*

Disturbances of adrenal function cause several types of disease, depending on the particular type of hormone involved.

Increased activity of the adrenal medulla, usually the result of a tumor, may result in attacks of sweating, palpitations, and high blood pressure. Overactivity of the adrenal cortex may also cause high blood pressure as well as a tendency to diabetes and obesity. Sometimes excessive secretion of adrenal hormone produces masculine sexual development in women. All these conditions are best treated at the present time by surgical removal of the offending tumor, or partial removal of the overactive adrenal gland.

Failure of the adrenal cortex (Addison's disease) may be caused by atrophy or tuberculosis of both adrenal glands. This disease is characterized by great weakness, weight loss, and loss of appetite. The skin usually has a characteristic brownish color and the blood pressure is very low. Formerly a highly fatal condition, Addison's disease may now be effectively treated by continuous administration of synthetic adrenal hormones, which take the place of the missing adrenal gland.

## *DISTURBANCES OF THE SEX GLANDS*

Diseases of the ovaries are better understood than their functional disturbances. Several types of cysts and tumors may involve them. The first symptom of these conditions is usually a disturbance of menstruation. Later the enlargement of the ovary may cause pain, and a tumor can be felt. The cysts occasionally grow to enormous

size if they are not removed The treatment of these conditions is surgical

Disturbances of menstruation due to disturbed ovarian function without actual ovarian disease do occur, especially during adolescence They are usually secondary to disturbed function of the pituitary or thyroid The treatment consists in correcting the primary condition

The menopause, or change in life, is due to the cessation of the endocrine activity of the ovaries In the vast majority of women this event does not cause any marked symptoms In some, however, it is accompanied by marked nervous depression or irritability, by "hot flashes," or by profuse flowing Such symptoms are usually due to the too rapid failure of the internal secretion of the ovaries and can be controlled by supplying enough of the secretion to compensate for the deficiency and to cause the changes in the body to take place more gradually Artificial menopause, due to necessary surgical removal, is usually extremely violent because of the sudden and complete cessation of ovarian function Whenever possible, a small portion of the ovary is left in place This often prevents severe symptoms

Diseases of the testicles Decreased testicular function occurring before puberty results in drastic impairment of normal masculine development, and a condition called *eunuchoidism* When occurring later in life, testicular failure usually causes only sterility and impotence Undescended testicles and inflammation due to mumps are causes of reduced testicular activity Very often such disturbances are secondary to pituitary failure *Tumors* of the testes fortunately rare, are usually malignant, they produce endocrine symptoms only occasionally Testicular deficiency may be effectively treated with the use of the male sex hormone, testosterone A tumor of the testis usually requires prompt surgical removal of the testicle

## *DIABETES MELLITUS*

Diabetes mellitus is a condition in which sugar is found in the urine In the normal person, the pancreas (an organ lying behind and below the stomach) prepares and discharges a substance into the blood called insulin, which enables the body to utilize the food

which is absorbed. In the diabetic person, the secretion is deficient either in quality or quantity, or for some reason it is unable to produce completely its normal effect. As a consequence, absorhed food, particularly sugar, is not properly used or stored. Abnormal amounts of sugar accumulate in the blood and body tissues of the diabetic person and some of this excess is exereted in the urine.

Diabetes may occur at any age, although the onset is usually during middle life. Persons in whose family diabetes occurs, particularly if they are much overweight, are especially liable to develop this disease, which is relatively common. It has been estimated that in the United States and Canada there are at least one million persons with known diabetes and another million with the condition in unrecognized, or latent, form.

*Symptoms.* The symptoms of untreated diabetes are: intense thirst, the passing of large quantities of urine, loss of weight and strength, and sometimes a ravenous appetite. Itching, particularly of the genitals, may be an additional complaint, as well as pain occurring in the legs, visual disturbances, and a tendency to boils and other skin infections. However, some patients have few or no symptoms. The symptoms are understandable if one considers that the patient is not properly using the food which is eaten, but is wasting it by excreting a large part of it in the urine.

*Treatment* of diabetes consists of three essentials:

1. Regulation of diet
2. General hygienic measures, including proper care of the feet and skin, and physical activity suited to the individual
3. The use of insulin when necessary

In 1922 a method was discovered by which insulin can be prepared from the pancreas of animals such as cattle, hogs, and sheep. Before this discovery diabetic patients did best when kept on near-starvation diets with radical restriction of foods, especially of starchy foods. At the present time, starvation diets are no longer necessary. The physician usually prescribes for the patient a diet which, although restricted, contains enough calories to enable him to maintain his weight and strength. If, on such a diet, the blood sugar remains too high and sugar in the urine persists, insulin is given in doses sufficient to prevent this. In some patients, however, restriction of

food alone is adequate to keep the blood sugar at a satisfactory level and the urine free from sugar It is important that the patient does not become overweight or, if already obese, that he lose weight to the level desirable for age and height At the present time, various types of diet are used by physicians These diets vary in the amount of starches, protein, and fat which they contain The essential thing is that a definite well planned method of treatment be followed The diet in diabetes is considered in Chapter 19, "Diet in Disease" The procedure for giving insulin is explained in Chapter 35, "Administration of Medicines"

Ordinarily, 20 to 30 minutes should elapse between the giving of insulin and taking of food However, if the insulin is of the NPH (Neutral Protamine Hagedorn) or protamine zinc type, this interval does not make so much difference because of the slowness with which the insulin acts

Patients are taught

1 How to perform simple tests for sugar in the urine
2 How to select and measure their food
3 How to give themselves insulin

They are also taught how to weigh their food in grams or how to measure it accurately in household measures so that they can be sure that they are taking the exact amount prescribed

Test for sugar in the urine. Put 5 cc (an ordinary teaspoon holds about this amount) of Benedict's solution in a test tube and add 8 drops of urine with a medicine dropper (For the sake of economy, ½ tsp of Benedict's solution and 4 drops of urine may be used ) Shake and place the tube in a small container of boiling water and boil for 5 minutes An enameled cup makes a good container, as it holds the test tube upright At the end of 5 minutes, remove the tube from the container and shake it If there has been no change in the color of the solution, the urine is sugar free A greenish turbidity (cloudiness) indicates the presence of a small amount of sugar, a yellow or reddish turbidity indicates a large amount *

* Various preparations for the rapid testing of sugar in the urine are now on the market and are available at most pharmacies. Those most commonly used are the Clinitest (Ames Co, Elkhart, Indiana) and the Galatest (Denver Chemical Mfg Co New York, N Y )

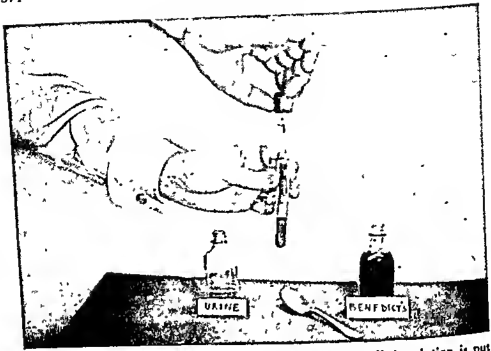


FIG. 47. First step in urinalysis. One teaspoon of Benedict's solution is put into the test tube and then 8 drops of urine are added to it. (Courtesy of Medichrome-Clay-Adams, New York, Dr. Henry Dolger, and the New York Diabetes Association.)

Complications. The chief complications to which diabetic patients are prone are the following:

1. Diabetic coma
2. Insulin reactions in patients receiving insulin
3. Infections, chiefly of the skin, such as boils or carbuncles
4. Cardiovascular-renal complications including:
   a) Extremities: Gangrene, usually of the feet, due to poor circulation and often associated with infection
   b) Heart: Angina pectoris and coronary heart disease
   c) Eyes: Retinitis, with often increasing impairment of vision
   d) Kidney: Chronic nephritis, in which both damage to the blood vessels and infection play a part
5. Nerve complications, including neuritis affecting chiefly the feet and legs, paralysis of the urinary bladder, and "diabetic diarrhea"

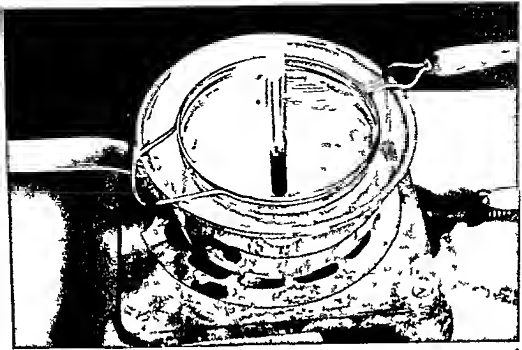

FIG 48 Second step in urinalysis The test tube is then placed in a cup of water or a strainer which is put into a pan of water The water is boiled for five minutes (Courtesy of Medichrome-Clay Adams New York, Dr Henry Dolger and the New York Diabetes Association)

**Diabetic acidosis and coma.** In the days before insulin was available, practically all diabetic children and most diabetic adults died in diabetic coma Diabetic coma is a condition of "acid poisoning" brought on by disregard of diet, by failure to take insulin when needed, and by infections of various sorts Warning signs of oncoming coma are variable but may consist of nausea, vomiting, and abdominal pain The patient's breathing is usually rapid, labored, and deep, the skin is dry and cold, the eyeballs are soft, and the breath has a fruity odor If untreated, the condition progresses gradually to one of unconsciousness The blood and urine contain much sugar and acid substances With the use of insulin and proper regard for diet, no diabetic patient need develop coma, but, if coma occurs, prompt and energetic treatment should be instituted Delay may be costly and even cause the death of the patient

When symptoms thought to be suggestive of coma appear, the patient should be put to bed, a specimen of urine tested for sugar, and the doctor called Since the doctor will ask at once if there is

sugar in the urine, it is important not to delay in making the test. A cup of hot broth is given every hour, and the patient is kept warm by means of blankets. A cleansing enema may be given. This and other treatment should await the physician's orders, but, if the diagnosis of coma is confirmed, such treatment will include large doses of insulin given early, together with large amounts of fluid intravenously.

In the prevention of coma, diabetic patients should be taught that, when ill, insulin should never be omitted, even though no food is eaten, unless the urine obtained every three or four hours is free from sugar.

Insulin reaction and its treatment. When patients are receiving insulin, the blood sugar occasionally falls to a level lower than normal. Such a condition causes a "reaction" or shock, which may be due to an excessive dose of insulin, too long an interval between insulin and food, or unusually strenuous or prolonged exercise. Symptoms vary considerably, but include hunger, weakness, restlessness or nervousness, trembling, double vision, and sweating. Delayed reactions due to the slowly acting protamine zinc insulin may be characterized by headaches, especially in the back of the head, nausea, and at times vomiting.

The treatment for an insulin reaction is aimed at restoring the blood sugar to normal by giving 2 or 3 oz of orange juice or ginger ale or a lump of sugar. Occasionally an insulin reaction may be severe, particularly if some time elapses before treatment. In such instances, excitement, convulsions, and finally unconsciousness may result. In this state it may be difficult to administer food by mouth because of the impossibility of cooperation on the part of the patient. If this occurs, a physician, who may give glucose intravenously, should be called immediately. Recovery from an insulin reaction is usually prompt and complete.

During an insulin reaction the urine is free from sugar. If there is a question whether or not a reaction is present, the patient should be asked to void completely and then to drink a glass of water. The urine voided 10 or 15 minutes later should be free from sugar. It is of the utmost importance that the nurse distinguish between the unconsciousness due to an insulin reaction and that due to diabetic coma, because in the former the giving of additional insulin might be disastrous, whereas in the latter it would be life-saving.

Other complications Diabetics are subject to hardening of the arteries relatively early in life Because of this fact, the circulation, particularly in the feet, is likely to be poor Furthermore, many diabetics, because of neuritis with involvement of the nerves, have feet which are not normally sensitive to pain or heat As a result they may burn their feet unconsciously and gangrene may result Also they may walk on feet with infected lesions, simply because they do not sense pain normally

Diabetic patients must take great pains to keep the skin clean and to give immediate attention to any cuts or cracks in the skin This is particularly important in regard to the feet, because neglect may result in infection

Infection and gangrene of the feet are always serious conditions, and in certain cases amputation of the foot or leg may be necessary

Because of lowered resistance of the skin, the diabetic, particularly the untreated diabetic, is prone to boils and carbuncles

*Hygiene of the feet*

1 The feet should be washed daily with soap and water and dried carefully, especially between the toes

2 The nails should be carefully cut, straight across

3 Corns and calluses should be cut only by a physician or a competent chiropodist who knows that the patient has diabetes They should never be removed with patent or other medicines The foot should be soaked in warm (not hot) soapy water, then the dead skin on or about the callus or corn gently rubbed off with gauze

4 Tight or badly fitted shoes should be avoided

5 *Hot soaks must never be used in the care of the feet of diabetic patients*

*Treatment of abrasions of the skin*

1 Proper first aid treatment is of the utmost importance even in apparently minor injuries The physician should be consulted immediately, particularly if there is any redness, pain, swelling, or evidence of infection

2 Strong, irritating antiseptics must be avoided

## *SUMMARY*

Disturbances of the endocrine glands—the thyroid, parathyroids, the pituitary, the adrenals, the pancreas, and the gonads—are chiefly

manifested by changes in the functions or structures controlled by their hormones. Usually it is the disturbance of gland function, rather than its cause, which must be treated. The basal metabolism rate, although not wholly conclusive, is useful in diagnosis, especially of thyroid dysfunction.

Symptoms of abnormalities in endocrine functioning are carefully noted. They should, in general, be well known to the nurse and she should be well informed about the symptoms of any condition where she is in attendance. Sometimes the symptoms are specific and distinctive. However, many factors have to be weighed before a correct diagnosis can be made, particularly in view of the fact that the pituitary gland controls so many different activities and regulates the activity of the thyroid and adrenal glands.

Diabetes mellitus, a disease of the pancreas, requires very intelligent and faithful nursing care. The nurse must understand the principles of properly proportioning the diet so that it is adequate to maintain normal weight, growth, and strength. The administration of insulin may be regarded as preferable to a near-starvation diet if the aim—to keep the urine free from sugar—is to be realized in more advanced stages of the disease.

## Questions

1. How are disturbances of the endocrine glands chiefly manifested?
2. From what do many disorders in the functions of the thyroid, sex, or adrenal glands result?
3. Define hypofunction and hyperfunction of an endocrine gland.
4. What does the abreviation BMR mean? What does it measure?
5. What is the purpose of antithyroid drugs?
6. What is the cause of cretinism? What are some of its symptoms?
7. What is this condition called if it develops in middle life or later?
8. What is the usual cause of hyperparathyroidism? How does this disease affect the calcium in the bones?
9. What is the usual cause of hypoparathyroidism? How is it treated?
10. Why are disturbances of the pituitary gland very complicated?
11. Why is there reduced thyroid and adrenal function when there is hypofunction of the pituitary gland?
12. How is diabetes insipidus controlled?
13. What is the best way of treating hyperfunction of the adrenal gland?

14 What is the cause of Addison's disease?
15 How is testicular deficiency effectively treated?
16 What gland normally produces insulin? What is the function of insulin?
17 What is the effect of diabetes on absorbed food, particularly sugar?
18 What are the symptoms of untreated diabetes?
19 What are the three essentials in the treatment of diabetes?
20 In 1922 what important discovery affecting diabetic patients was made?
21 Discuss the diet of the diabetic patient
22 What three procedures are diabetic patients taught?
23 Describe the test for urine which uses Benedict's solution
24 Discuss the significance of color in specimens of urine being tested for diabetes
25 To what four complications are diabetic patients prone?
26 What four parts of the body are affected in cardiorenal complications?
27 What is diabetic coma? What relation does it have to acidosis?
28 What are some signs of approaching diabetic coma?
29 What treatment for coma is effective?
30 What treatment can the nurse give while waiting for the physician?
31 Why should a specimen of urine be obtained before the doctor's arrival?
32 What are some of the symptoms of an insulin reaction?
33 What attempts may be made during an insulin reaction to restore the blood sugar to normal?
34 Why is it of the utmost importance that unconsciousness caused by an insulin reaction be distinguished from that caused by diabetic coma?
35 Why are the feet of some diabetics not normally sensitive to pain or heat?
36 Discuss the importance of skin care of the diabetic
37 Discuss the hygiene of the feet of the diabetic patient
38 Are hot soaks or strong irritating antiseptics harmful to diabetic patients?

# 50

# SOME ABNORMAL CONDITIONS AND DISEASES OF THE EYE AND EAR

## *ABNORMALITIES AND DISEASES OF THE EYE*

**Eyestrain.** Diseases of the eye are due to injury, infection, degeneration, congenital defects (often hereditary), malformation, or tumors. Important adjustments are necessary: first to turn the eyes toward the object to be seen, an act called fixation; second, to focus the image clearly on the retina, an act called accommodation. Eyestrain is a strain of these adjusting mechanisms. Glasses, by helping in these adjustments, aid in attaining clear vision and in relieving eyestrain. The commonest causes of eyestrain are first, *hypermetropia,* in which the eye is shorter than normal, hence the image falling on the retina at the back of the interior of the eye is not clear; second, *astigmatism,* the name given when the surfaces of the eye responsible for sight are uneven, as in the cornea (clear portion above the pupil), front or back of the lens, and the retina. Both can be corrected by glasses. (See Chap. 16, "Anatomy and Physiology of the Eye and Ear.") The commonest infections are:

**Conjunctivitis.** In this condition germs grow on the mucous membrane called the conjunctiva; symptoms are redness, discharge of mucus, and tears. ***Trachoma,*** a very severe infection of the con-

junctiva and cornea, is due to a virus which is extremely contagious, very chronic, but regional in distribution Gonorrhea may attack the conjunctiva, only rarely, fortunately, but its chief area of attack is the cornea *Gonorrhea* and other forms of infection are liable to attack babies' eyes, which may become infected during the process of birth Babies' eyes recover more easily than adults' from these infections, but they need prompt and skillful treatment

The chief danger in any conjunctivitis is that the cornea may become involved When this happens, the condition is known as *keratitis* The cornea is protected by its very smooth covering of epithelium If this gets scratched, for example, by the dropper or the finger, the germs are able to enter the tissue of the cornea, and may cause loss of the eye

In conjunctivitis and keratitis, the germs which cause the inflammation enter from the outside

Retinitis implies an inflammation of the retina which may be due to any infection, although the more common types of retinitis are degenerative Important causes are arteriosclerosis, kidney disease, and blood disease

Glaucoma is a condition, due to various causes, in which the fluids do not circulate in and out of the eye as they should Since the outlets are obstructed, the pressure of fluid in the eyes rises, therefore the eye becomes tense and hard This increased pressure damages the nerve and the retina, thus gradually causing blindness With suitable early treatment, the eyesight can be saved

Cataract. When the lens of the eye is not clear but cloudy—more or less opaque—the condition is called cataract There is no certain cure but operation, and that is almost always successful The time to operate is when the sight is so much impaired that the patient can not enjoy work or life, because too early operations may impair the sight permanently

A sty is a small abscess at the root of an eyelash, similar to an acne pustule on the face The large glands in the lids secreting the oily substance that keeps the eyelids from sticking together and keeps the tears from running over the lids sometimes become so obstructed that the secretion accumulates inside and sets up an inflammation of a chronic type this is called a ***chalazion***, or blind sty

Blocked tear ducts Overflow of tears is caused either by too abundant a supply of tears as in weeping or when the eyes are irri

tated by wind, smoke, bright light, and so on, or by obstruction to the outflow of tears which normally takes place by way of the tear duct into the nose. Sometimes the tear duct is open at birth, but, if not, it usually opens before long. If the tear duct is inflammed and pus forms, it may need operative treatment.

Iritis. In another group of eye diseases, of which iritis is the best example, the germs reach the eye through the blood. Thus inflammation of the iris and adjoining parts—iritis or uveitis, as it is often called—is one of the large group of diseases that sometimes result from foci of infection. A focus of infection is a place where germs are growing and from which they may enter the blood and so reach almost any part of the body. Favorite places for the germs to grow and form foci are the roots of the teeth, the tonsils, the sinuses, the gallbladder, the pelvic organs, and so on. Iritis is a severe disease and may cause blindness. Other causes of iritis are tuberculosis and syphilis. In these forms of iritis the germs reach the iris from other parts of the body through the blood.

Myopia, or nearsightedness, is a condition in which the eyeball is too long. At birth the eye is small and imperfect. Sometimes the processes of growth, usually so wonderfully controlled, result in too long an eyeball. This is myopia, most frequent in children with a family history of myopia. In the majority of cases the process is self-limited and ceases before the age of twenty-one. In rare cases it is malignant and causes serious damage to the eye. Hence, myopia should be watched during childhood to guard against complications.

## THE PROSTHETIC EYE

It is sometimes necessary to remove the eyeball, following severe injury, infection, blindness due to glaucoma, or some malignant growth. The eye is also removed sometimes for cosmetic reasons, when an artificial eye is preferable to a scarred or shrunken (sightless) globe.

Artificial eyes are made of blown glass or, more recently, of plastic materials. The length of time a prosthesis (artificial substitute) can be worn depends entirely on how much irritation, inflammation, or discharge it produces in the surrounding socket. Some patients

tolerate artificial eyes so well that they rarely have to be removed The doctor will give orders regarding the time and frequency of cleansing the artificial eye

Although most people prefer to cleanse the artificial eye themselves, the practical nurse should be ready to do this for the patient if it is desirable or necessary

To cleanse the artificial eye

*Equipment*

| | |
|---|---|
| Bowl of warm saline solution | Toothpick swabs |
| Container with layer of gauze | Gauze |
| Rubber bulb syringe | Kidney basin |

*Procedure* To remove an artificial eye, take a toothpick swab in one hand and place it on the lower lid margin, on or just below the lower lashes Press the lid margin slowly but firmly downward and backward until the lower edge of the prosthesis appears above the depressed lid margin, and then continue and increase the pressure gradually until the greater part of the prosthesis margin becomes visible Suddenly the artificial eye will pop out of the socket To be sure that the prosthesis will not fall on the floor and break, either perform the operation over a bed or be prepared to catch the prosthesis in your other hand, held just below the eye on the cheek When it is out, place it safely, resting on gauze, in a container

Irrigate the eye socket with warm saline solution, using the rubber-bulb syringe and kidney basin

Wash the artificial eye very carefully with gauze, using the remainder of the saline solution

To replace the eye. Moisten the eye with saline solution and hold it between the thumb and index finger with its widest end at the outer edge where the lids meet

Raise the upper lid at center with the forefinger and thumb of the left hand Place the artificial eye under the upper lid Draw the lower lid down so that the eye will slip into place

*Points to remember*

1 Observe all rules of asepsis to prevent infection of the socket

2 An artificial eye is expensive, take care to prevent its loss or the breaking or scratching of its surface

3 When the artificial eye is out of the socket for any length of time, it should be kept on a piece of gauze in a container filled with saline

solution. The top of the container should be completely covered. In the hospital, the patient's name should be plainly printed on the top of the cover of the container, which is kept in the bedside-table drawer.

## *SOME DISEASES AND INJURIES OF THE EAR*

### THE EXTERNAL EAR

Hematoma. A blow on the ear may cause a hemorrhage under the skin. This is called hematoma, and should be treated by an otologist to prevent infection which may cause disfigurement of the concha (external ear), known as a cauliflower ear. (See Chap. 16, "Anatomy and Physiology of the Eye and Ear.")

Eczema, impetigo, and erysipelas are *bacterial infections* and must be treated by keeping the surface free from water, applying local antiseptics, and sometimes one of the sulfa or antibiotic drugs.

Otomycosis of the canal is a *fungus infection* and should be treated by keeping the surface dry and applying an antiseptic; neither sulfa nor antibiotics are helpful.

A boil, or furuncle, is a very painful abscess in the canal and is best treated by an otologist. Heat, an anesthetic ointment, and an antibiotic drug are usually sufficient; sometimes it is necessary to incise and drain the boil.

Wax and foreign bodies in the ear should be removed by an otologist. They are common causes of temporary deafness.

Tumors. Sometimes the external ear is the site of malignant tumors. These can be seen easily by the otologist and call for radical surgical removal.

### THE MIDDLE EAR

Otitis media is a nose or throat infection which has passed into the middle ear by way of the Eustachian tube. Occasionally it merely blocks the Eustachian tube without actually reaching the middle ear. This causes a feeling of fullness and deafness, and sometimes pain in the ear; it is treated by relieving the obstruction in the Eustachian tube. If the infection reaches the middle ear, the drum becomes inflamed and pressure increases because of the flow of serum and

pus into the middle-ear cavity In more severe cases the infection reaches the mastoid cells The drum is incised by the specialist, and one of the antibiotic drugs or combination of them is given until all infection has ceased

Acute mastoiditis is characterized by purulent discharge through the drum, with pain tenderness, and swelling over the mastoid process The patient often has severe headache In very serious cases, if the infection extends to the meninges or to the blood stream, there will be other signs also, such as chills, dizziness, nausea and vomiting, and a stiff neck Sometimes the disease causes pressure on the facial nerve, leading to facial paralysis Any of these symptoms call for the immediate attention of an otologist (ear specialist)

Chronic middle-ear infection is usually the result of an acute middle ear infection with mastoiditis, which did not completely heal It is characterized by a persistent, usually foul smelling discharge and deafness The drum has a permanent perforation It is important to keep water out of the ear to prevent the infection from speading If the infection is cleared up, the ear does not discharge, but the perforation and the loss of hearing remain Persistence of the infec tion always carries with it the danger of spreading infection to the labyrinth or blood stream Such cases should be under the care of an otologist

## LABYRINTHITIS

This is a disease of the semicircular canals It may be mild and temporary This inflammation is caused by irritation of the canals by such disturbances as digestive upsets, certain drugs, toxins from infections of the teeth, throat, and sinuses, and even from long-standing strain and fatigue Infection of the labyrinth from otitis media is a much more serious affair, and should the patient become dizzy while the ear is discharging, the doctor should be notified *Meniere's disease* is a form of labyrinthitis which tends to recur and usually is caused by circulatory changes in the labyrinth The patients are often severely nauseated For all labyrinthitis cases the patient must be kept quiet and comfortable by sedation The cause, if it be a food, drug, or infection, must be eliminated It always calls for expert medical attention

## DEAFNESS

Deafness is of two types, and generally we can state that a patient has either (1) a conductive deafness due to some interference of the sound waves reaching the end organ in the cochlea, or (2) nerve deafness, where the end organ itself is affected. In any case of deafness the otologist must determine by examination and hearing tests whether it is nerve deafness or conductive deafness.

Conductive deafness is caused by wax, a foreign body, canal infection, middle-ear infection, or a thickening of the middle-ear structures.

Nerve deafness is due to some of the infectious diseases, such as scarlet fever, mumps, and influenza; to toxins from bad teeth, tonsils, and sinuses; and to circulatory changes in the inner ear.

*Treatment* is determined by the type of deafness with which we are dealing. Recent onset of conductive deafness usually means that there is an obstruction in the canal or middle ear or Eustachian tubes, which can usually be corrected, followed by rapid recovery of hearing. Nerve deafness calls for the elimination of all foci of infection and the correction of general circulatory conditions if present. However, there are many cases of both conductive and nerve deafness where hearing cannot be corrected, and for these persons a hearing aid and sometimes instruction in lip reading is advisable. When buying a hearing aid, a patient should never "shop around," but should always seek professional advice. Conductive deafness and nerve deafness have a basic difference. In the former type one cannot hear as well when the sounds come by air through the canal and middle ear as when the sounds are passed through the mastoid bone directly to the cochlea. In nerve deafness it is just the opposite. Therefore, hearing aids are made with attachments for either bone conduction (behind the ear) or air conduction (through the canal). There are other mechanical differences, but the patient is not competent to evaluate them. Careful testing of the hearing and the professional advice of an otologist are essential to determine the proper type of hearing aid.

Fracture of the temporal bone may occur in any severe head injury. In such cases one should observe if there is bleeding or escape of cerebrospinal fluid from the canal. Sometimes the injury affects only the drum and causes a temporary loss of hearing, but if there is

a break through to the inner ear, there is danger that the nerve and cochlea will be affected with permanent deafness Expert care is essential in any head injury

## *SUMMARY*

The eyes may become strained, requiring glasses for relief, when the eyeball is not normal in shape but is malformed Diseases of the eye are caused by infection, degeneration, irritations, and eye tumors

In some diseases of the eye, such as conjunctivitis—trachoma, gonorrhea, and keratitis—the cause of infection enters from outside, in others, such as iritis, the infection is carried through the blood stream In glaucoma the fluids do not circulate as they should, in cataract the lens is not clear, in a sty a small abscess has formed In myopia the eyeball is too long, in astigmatism the eyeball is irregular

Since loss of sight is a serious threat, all diseases and abnormalities need expert diagnosis and specialized treatment

If the eyeball is removed, an artificial eye, or prosthesis, may be worn Prostheses are expensive and the nurse should be careful not to scratch or break them The orbit of the eye requires good nursing care to keep it from becoming infected

The external ear is subject to infection which is sometimes cleared by the use of antiseptics and sometimes by the use of the sulfa or antibiotic drugs It may be the site of malignant tumors, which should be removed Infections may reach the middle ear from the nose and throat An obstruction in the Eustachian tube may cause pain in the middle ear, and deafness The drum of the ear may become perforated, resulting in a permanent deafness, although the infection may be cleared up

The semicircular canals may become diseased from various causes, and develop into a serious condition In all cases of labyrinthitis, the doctor should be called at once

Deafness is of two types conductive and nerve deafness Since hearing aids are designed particularly for each type of deafness, a patient who intends to get such an aid should consult an otologist rather than "shop around" for an instrument without knowing which kind will benefit him most

## Questions

1. What is eyestrain?
2. What are two most important causes of eyestrain?
3. What are the causes of some diseases of the eye?
4. Name two or three diseases of the conjunctiva.
5. What other part of the eye may become involved in keratitis?
6. How do the germs which cause keratitis enter the eye?
7. Name three diseases which cause infection of the eye.
8. Describe the conditions prevailing in glaucoma.
9. What is the best treatment for cataract?
10. What is another name for a blind sty?
11. In iritis, how do the germs which cause infection reach the eye?
12. What are two other diseases, besides iritis, which are caused in a like manner?
13. If myopia is usually self-limited, why is it important to watch it during childhood?
14. Why may it be necessary or desirable for the surgeon to remove the eyeball?
15. How does a nurse remove an artificial eye? Give details of the procedure.
16. What precautions does the nurse take to protect the prosthesis from damage or breakage?
17. How is the artificial eye cared for if it is out of the socket for some time?
18. Name three bacterial infections of the ear. What general treatment is recommended?
19. What is otomycosis? How is it treated?
20. How does an otologist treat a boil in the ear?
21. Discuss the importance of expert removal of foreign substances from the ear.
22. What disease of the ear is caused by infection of the nose and throat?
23. What treatment may be given in severe cases of this disease?
24. Name the symptoms of acute mastoiditis which warrant calling a physician at once.
25. From what condition does chronic middle-ear infection usually arise?
26. With what part of the ear is labyrinthitis connected?
27. What are some of its causes?
28. What does nursing care of these patients include?
29. Discuss the possible effect of fracture of the temporal bone on the ear.

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# MALIGNANT TUMORS

The term "malignant tumors" is applied to any lawless growth of body cells which, in its progress, destroys normal body tissue. Different names are applied to different types of malignant tumors, such as cancer, sarcoma, epithelioma, and so on; but they all possess the common characteristics of destroying normal tissue in their neighborhood. Almost all of them tend to metastasize, that is, to scatter through the body and grow in several different locations; thus almost any organ may be attacked by a malignant tumor.

Symptoms may be divided into two groups:

1. Those due to the destruction of the organ in which the growth is taking place
2. The general symptoms of loss of weight and strength, which occur sooner or later in every patient who has the disease

These general symptoms may be due partly to poisons manufactured in the new growths and partly to invasion of other organs.

Because most malignant growths begin as small lumps and because the only cure lies in removing or destroying the growth before it has metastasized (scattered), any lump appearing anywhere in the body should be examined immediately by a doctor. Surgical removal or the use of radium or x-rays may be prescribed. Not all malignant growths start on the surface of the body, however. Many

begin in some internal organ, where the growth cannot be seen, and the first sign of their presence is often bleeding, usually not severe at first. Therefore, any unexplained bleeding should be immediately and thoroughly investigated, since it may be due to cancer. Similarly, persistent indigestion, difficulty in swallowing, or a change in bowel habits indicated by diarrhea, constipation, or alternating attacks of both may be indicative of cancer in the digestive tract. Persistent hoarseness or cough may be symptoms of cancer of the respiratory tract.

In the mouth and on the skin, since malignant growths may not at first appear as typical lumps, any sore which does not heal promptly or any wart or mole which suddenly starts to change in color or to enlarge is sufficient reason for consulting a physician at once. The fact that there is no pain does not prove that there is no malignant growth. Pain is usually a late symptom.

**Popular beliefs.** Since the cause of cancer is not yet known, and since people demand an explanation of their diseases, a number of mistaken or unproved ideas about it are generally believed to be true. Commonest of these is the fear that cancer may be contracted in taking care of a patient who has a cancerous condition. As there is absolutely no proof that this is so, and much to prove that it is not, one need have no fear that cancer is contagious. There is also no proof that cancer is hereditary. It is possible that a tendency to cancer may be inherited but there is little reason to believe that, because one member of a family died of cancer, others must. Because of this possible tendency, however, doctors believe that all irritated spots and all sores which do not heal should be regarded as possibly "precancerous conditions" and that they should be treated promptly.

**Cure.** As has been said already, the only treatment of cancer which offers any hope of cure is its early and complete removal or destruction. Anything less than that, although it may cause apparent improvement, is, in the light of our present knowledge, a waste of time and money and may give the growth the chance to scatter, thus becoming incurable. Various "cures without the knife" and cures by secret remedies are very dangerous; therefore, physicians are opposed to them.

**Nursing care.** It is a mistake to believe that little can be done for the patient with advanced cancer. Such patients need the most skillful care. It is important to show absolutely no fear of the disease

and to make the family and the patient understand that it is neither contagious nor hereditary

The disease uses up the fluids of the body The art of supplying fluid to a cancer patient is what makes much difference between suffering and comparative comfort Liquids can be prepared and served in tempting ways and brought to the patient's bedside in small quantities at frequent intervals It is a mistake to serve the same liquid at the same hour each day

Frequent back rubs and change of position are helpful Great care must be taken to keep the skin well oiled with lanolin or olive oil, as it is likely to be dry

*Dressings* Great relief is given to the patient by the application of fresh dressings if this is done quickly and skillfully When there is a profuse discharge, it is necessary to use sufficient Cellucotton to prevent soakage through too quickly, but wastefulness should be avoided Cellucotton is suggested instead of absorbent cotton, as it is a suitable material and can be bought in quantity cheaply

The adhesive plaster securing the dressing should not be removed every day, since there is danger of injuring the skin A fresh piece of adhesive may be applied over the old piece without coming in contact with the skin Scotch tape may be less irritating than adhesive plaster

When the dressing must be changed frequently, a tape strapping, known as Montgomery tapes, may be used This is made with 2-inch adhesive tape, cut 3 to 4 inches long Cotton tape is tied through a slit in one end of the adhesive Two or three of these strips may be used on each side of the wound The tapes are then tied over the dressing to hold it in place When the dressing is changed, the tapes are untied, a fresh dressing is applied, and the tapes are retied Sometimes the tapes become soiled and must be replaced

*Prevention of odors* Any discharge from a cancer may have an offensive odor, and to many patients the knowledge that there is an unpleasant odor about them is very depressing Therefore, it is important that the patient's room should be well ventilated and that any dressings should be changed often and disposed of Deodorants such as oil of lavender or orange may be sprayed around the room with an atomizer, but the effect is not lasting and must be renewed at intervals during the day

Certain preparations on the market are considered quite effect-

tive in preventing odors. However, it is much better to depend upon plenty of air and plenty of soap and water than on deodorants, which never entirely conceal the odor of a cancer discharge.

**Care after colostomy operations.** Patients who have cancer in the abdominal region sometimes have a colostomy operation. This means making an artificial opening (artificial anus) into the colon to allow the expulsion of fecal matter.

As the odor is very disagreeable, the dressings must be changed frequently until the patient is able to regulate his colostomy. Irrigations are usually done daily immediately after surgery. When the individual becomes accustomed to the normal diet, avoids those foods that cause him distress, and establishes a regular time schedule, irrigations may be necessary only every other day. (See Chap. 33, "Irrigations of Body Cavities.")

In caring for such a patient, the nurse must be very tactful and thoughtful, because he is naturally sensitive, and will need encouragement to resume his social and business relationships without embarrassment.

**Drugs.** Morphine is usually necessary to relieve pain in the last stage. Its use should not be begun as long as other measures will keep the patient comfortable, but it should not be withheld from a patient with cancer when it is the only thing that will control pain. The decision about when to begin its use and how much to give at a time is the responsibility of the physician. In the early stages he usually prescribes sedatives to be given when necessary to keep the patient comfortable, and to induce sleep.

It has been found that with an adequate diet, high in calories, and good general nursing care the patient requires less sedation.

The patient's symptoms are often the result of nervousness rather than pain, and it is a test of good nursing to control this condition without resorting to the prescribed sedative. Gentle rubbing to relax tired muscles of the neck and back and a hot drink at bedtime may be sufficient to induce sleep.

**Points to remember.** The nurse's duty is to try by every means in her power to make the patient comfortable and to keep the surroundings quiet and cheerful. The latter is very difficult, as the patient is naturally depressed.

The patient may ask whether he has cancer, but it is not the nurse's place to answer this question. She should try to turn the

patient's thoughts elsewhere and, if not successful, should refer the matter to the physician

If the patient shows irritation over minor incidents or makes what seem to be unreasonable demands, the nurse should realize that it is all a part of the disease Most cancer patients are very sensitive and need sympathetic and understanding care

Some occupation is very necessary to prevent the patient from brooding over his condition, but it should be something which he can see is really helpful and not invented to give him something to do Darning stockings, sorting linen, or any simple household task makes the woman patient feel that she is still a useful member of the family It may be possible to help a man select a hobby which will be both interesting and useful (see Chap 29, "Keeping the Patient Contented")

## *SUMMARY*

Although different names are applied to different types of malignant tumors, they all possess the common characteristic of destroying normal tissue in adjacent areas Their symptoms are caused by the destruction of the organ in which they are situated, plus loss of weight and strength

Since surgical removal or the use of radium or x rays offer the only treatment at present which gives hope of cure, and since malignant growths begin as small lumps, it is of great importance that the patient be seen by a doctor as soon as possible after any symptoms appear

Malignant tumors are not contagious

Patients with a malignant growth need the most skillful nursing care They require large amounts of liquid to reduce their suffering Every effort should be made to offer a variety of suitable liquids, served attractively The skin should be kept well oiled

Dressings of a wound need to be changed frequently, and irritation to the area should be kept at a minimum

Sedatives may be given in the earlier stages of these diseases, morphine is generally necessary to relieve pain in the final stages Measures to keep or make the patient relaxed tend to reduce the amounts of sedatives required to keep the patient comfortable

## Questions

1. What is the common characteristic of all malignant tumors?
2. What are three malignant tumors?
3. What symptoms may be due to cancer which begins in some internal organ?
4. What treatments offer some hope to cancer patients?
5. Discuss some of the unfounded popular beliefs about malignant tumors.
6. Discuss the role of liquids in the diet of these patients.
7. Describe Montgomery tapes and point out their use.
8. What should the nurse say if her patient asks if he has a cancer?
9. Discuss the value of diversions for the patient with a malignant tumor.

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# MICROORGANISMS

Microorganisms may be thought of as living in a world of their own, completely unseen by the naked eye. Yet they have invaded every inch of our environment. Among them is a wide variety of living organisms, all of which are being subjected to serious and intensive scientific study. Microorganisms are of great practical importance to us, for they are the cause of food spoilage, souring of milk, and of vegetables and animal matter decomposition. Even though many of these tiny organisms are actually beneficial to mankind, as are those which improve the soil, those which are harmful are among the most deadly enemies of health. They are so numerous, they multiply so fast, and they produce so many death dealing diseases that the practical nurse, as well as the homemaker and food handler, is vitally concerned with their control.

Viruses are the smallest living things known. They cannot ordinarily be seen by means of a standard laboratory microscope and can pass through the finest porcelain filters, so they are called filterable viruses. They are responsible for such communicable diseases as the common cold, anterior poliomyelitis, mumps, and measles.

## *SOME USEFUL AND HARMFUL ORGANISMS*

It is important for us to know something about microorganisms because they are both useful to us and harmful.

Bacteria. Certain bacteria play a useful part in the world, while others, when they enter the body and reproduce there, cause disease.

While the useful bacteria and the ones which are quite harmless are much more numerous than the ones which cause disease, those who care for the sick should know something about the disease-producing organisms in order to protect themselves and to take intelligent care of a patient. It is equally important for those who guard the health of a household to know what causes disease and how it may be prevented.

Protozoa, one-cell forms of animal life, are generally visible only through a microscope. They are the largest of the microorganisms, being at the opposite end of the scale from the viruses. They are larger and more complex in their activities than bacteria. All protozoa are able to move. Some reproduce by division and some sexually. One protozoan causes malaria.

*Mold and yeast plants* are colorless and are more simple in structure than the familiar green plants. The colorless plants, known as fungi, are unable to manufacture their own food and must obtain it from living and decayed plants and animals.

Molds are found on any kind of vegetable or animal matter, such as bread, fruit, cheese, wool, and leather. They multiply rapidly under favorable conditions: darkness, moisture, air, and warmth.

The temperature at which they grow best is between 68° and 86°F. (20° and 30°C.), which shows why it is necessary to keep food dry and at a low temperature.

As molds grow on the surface, they send tiny threads throughout the material until the whole substance is interlaced with the threads. Some of these threads extend beyond the surface and have at the end a little rounded body known as a spore case which contains the spore or seeds of the mold. These little spore cases may be white or blue-green or red or brown, according to the kind of mold, and may give the characteristic color to the growth of the mold, such as the blue-green mold sometimes seen on oranges or lemons or the black mold on bread. As these spore cases are above the surface of the material, they are easily dislodged by the air and blown about. When they find conditions they like, they begin to grow and reproduce again.

Useful molds. Molds are cultivated in cheese to give a characteristic flavor, such as Roquefort or Limberger.

Important drugs, such as penicillin and streptomycin, are derived from certain molds. These drugs are called *antibiotics* because they have the power to check the growth or to destroy certain disease-producing organisms.

HARMFUL MOLDS. One variety of mold causes the skin disease known as ringworm, and another variety causes "athlete's foot." Both are easily spread and very hard to cure. (See Chap. 43, "Some Diseases of the Skin.")

The chief harm that molds do is to change the flavor of food, and spoil it. A good housekeeper prevents spoilage by keeping food dry and cold, and in clean, covered containers.

Yeasts. The yeast plant, more simple in structure than the mold plant, consists of a single colorless cell, oval or round in shape. The yeast cells reproduce by budding. Each cell produces a daughter cell, which eventually breaks off and reproduces in the same manner. The food required by yeast is sugar in solution. Yeasts grow rapidly in a warm temperature and are killed at boiling temperature (this is the reason tepid water is used for dissolving a yeast cake).

One of the yeasts is cultivated for commercial use and is best known in the form of yeast cakes, which are a mass of living, although inactive, yeast cells held together by starch. When the proper temperature and food are provided, the yeast cells begin to grow and multiply.

Yeasts, which are almost universally in the air and carried on the skins of fruit, are known as wild yeasts. In making wine, we rely on these wild yeast plants to ferment the juice of grapes and apples. When the juice is first pressed out, it is sweet, but, after standing for some time, fermentation begins. These wild yeasts in the air cause jellies or fruits, left standing in a warm place, to ferment.

FERMENTATION. As yeast feeds on sugar solution, it produces a change known as fermentation. The sugar is broken down into alcohol and a gas called *carbon dioxide*. Fermentation is the method by which alcoholic liquors are made, but the raising of bread is also a fermentation process.

The yeasts described above are sometimes called the "sugar fungi." The only harm they do is to spoil sirup and jellies by fermentation. Thrush, a condition seen in the mouths of infants, and a few very rare diseases are caused by yeasts.

Bacteria are found everywhere in nature where animal or pla life exists. They are much smaller than yeasts or molds. Some them are so small that, if 1500 were placed end to end, they wou reach only across the head of an ordinary pin.

Shapes of bacteria. Bacteria (singular: *bacterium*) a divided into three groups according to their shape. Under a mic scope, which magnifies them about one thousand times, some a seen to resemble little sticks or rods. These are called *bacilli* (sing lar: *bacillus*). An example of the bacillus is the organism whi causes typhoid fever. Others are round or oval in shape and a called *cocci* (singular: *coccus*). Cocci may occur singly, in pairs, chains (streptococci), or in grapelike masses (staphylococci). example of the coccus is the pneumococcus, which causes pn monia. Others are spiral-like tiny corkscrews; these are called *spir* (singular: *spirillum*). An example of a spirillum is the organi causing syphilis.

Color of bacteria. When bacteria reproduce on food materi they cluster together in masses forming colonies which can be se with the naked eye. Although the bacteria are colorless, some spec form a pigment as they grow.

Movement of bacteria. Some bacteria can move in liquid means of minute motor hairs which project from the cell wall. Th motor hairs are called *flagella* (singular: *flagellum*).

Food of bacteria. Bacteria feed on dead or living animal vegetable matter containing proteins, fats, and carbohydrates. T bacteria which feed on dead animal or vegetable matter are cal *saprophytes*. As they take in nourishment through their cell wa excrete their wastes, and reproduce, they cause changes in the fo material variously known as putrefaction, decomposition, or dec The bacteria which feed on living animal or vegetable matter called *parasites* and are usually found in or on living bodies plants, animals, or human beings.

## CULTURES, OR HOW MICROORGANISMS ARE GROWN ARTIFICIALLY

Bacteriologists test for the presence of bacteria by taking wha known as a *culture*. A sterilized cotton swab is rubbed over sc surface of the body, as a throat culture in diphtheria, and t

rubbed on some culture medium A culture medium is food on which bacteria will feed, as beef broth or beef broth solidified by gelatin or agar, coagulated blood serum, and the like Favorable conditions for the growth of bacteria are supplied by the laboratory If the bacteriologist cannot succeed in making any bacteria grow, he has a sterile solution or object In this way many diseases which appear in the human body are identified A culture of the diseased part is taken planted on the proper medium, and later examined under a microscope to ascertain what bacteria are present

Reproduction The characteristic way in which bacteria reproduce is by *fission* The individual cell lengthens then splits into two cells Under favorable conditions multiplication is so rapid that one bacterium may reproduce 17 million descendants in 12 hours This process is fortunately checked by the fact that conditions are often unfavorable or that the bacteria are killed by their own waste products

A few bacteria are able to go into a resting stage when conditions are unfavorable for their growth and are then called spores They form a protective covering for themselves, and the spore may live a long time even if it is inactive When conditions become favorable, the spore will burst out and resume its active life It is important to know about spores because spore forming bacteria can stand high temperature and other unfavorable conditions, therefore, it takes longer to kill them than bacteria which do not form spores The bacteria which cause tetanus (commonly called lockjaw) form spores

Relation of temperature to growth From 70° to 100°F (21 1° to 37 7°C ) seems to be the temperature at which bacteria grow most rapidly, although many grow at a temperature not much above the freezing point of water, 32°F (0°C ) and some species grow only at a very high temperature The lowest temperature which kills bacteria, which is known as the thermal death point also varies with the species, but not all in the spore state are killed at the boiling point of water, 212°F (100°C ) To assure asepsis a condition free from bacteria, an apparatus or sterilizer called an autoclave is used The articles placed in the chamber of the autoclave are sterilized by being subjected to steam under high pressure Steam under 15 to 20 pounds pressure will kill all bacteria and spores in 15 minutes

Oxygen. All bacteria require oxygen to live. Those which depend on the oxygen in the air are called aerobes, and those which cannot live where free oxygen is present are called anaerobes. The latter obtain their oxygen from foods which contain this element. The tetanus germ is an anaerobe; thus all wounds likely to be infected with these germs are kept open so that the air may help to kill them. A third group of bacteria is able to live either in the presence or in the absence of air.

Moisture necessity. Bacteria must have a great deal of water in order to live. This fact is relied upon in the preservation of food by drying, since we know that bacteria cannot grow unless moisture is present.

Light. Most bacteria are killed when exposed for a sufficient length of time to the direct rays of the sun.

## USEFUL BACTERIA

Although we may be more vitally interested in the microorganisms which cause disease, we should not forget that bacteria are absolutely essential to life.

How bacteria cause decay. Without bacteria there would be no decay, and without decay the earth would be cluttered with dead products. Decay is caused when bacteria feed on dead plant or animal matter and change it into substances which enrich the soil and make it favorable for plant life. Animals eat the plants and get minerals necessary to their life. This cycle is continuous.

How some bacteria are used in industry. Bacteria play a useful part in many industries. Vinegar is made by the action of bacteria which make acetic acid. The lactic acid bacilli in milk are relied upon to cause the souring of milk, which is useful in diet and some food preparations. In the purification of a water supply, these invisible workers feed upon harmful bacteria in the water as it passes through filter beds of sand and gravel.

## HOW BACTERIA ARE TRANSMITTED

Since bacteria cannot get about by themselves, they must be transported in some way. They are transmitted by contact, food,

clothing, dust, domestic animals, insects, vermin, and human carriers.

The disease-producing organisms are transferred by body or *direct contact,* for example, when the infected person kisses or touches another person.

*Droplet infection,* another example of direct contact, is the usual way in which respiratory diseases are transmitted. The moisture expelled from the mouth or nose, in coughing, or sneezing, may contain harmful bacteria. Everyone should be careful to cover his nose and mouth with several thicknesses of disposable tissues when coughing or sneezing. Colds, influenza, and other diseases of the respiratory tract are easily spread in crowded places, such as buses, elevators, theaters, and schools.

When articles contaminated by an infected person are handled by another person, the harmful bacteria may be transferred by *indirect contact.* In our daily life we rarely know what articles are contaminated; therefore it is necessary to wash the hands frequently and to keep the fingers out of the mouth.

Bacteria may be carried from an infected person to another by *vectors* or living creatures, such as rats, mice, insects, or other vermin.

Bacteria are transmitted by *vehicles,* such as water, milk, food, and air. For this reason, the water supply should be pure and kept under rigid sanitary control.

Bacteria can live in milk and multiply rapidly; so it is important to protect the supply at every step of processing.

*A human carrier* is a person who shows no sign of illness, yet harbors the disease-producing organisms in his body. He may transmit them to others and in this way become a great menace to society.

How bacteria enter the body. Bacteria can enter the body by four avenues:

1. The respiratory tract: nose, trachea, lungs
2. The alimentary canal: esophagus, stomach, intestines
3. The genitourinary tract: urethra, bladder, vagina, uterus
4. Abrasions or breaks in the skin: by entering the blood stream and lymphatics

**How bacteria leave the body.** Bacteria may be found in the material discharged from the body, as in saliva, urine, feces, sputum, and mucus. The route by which they leave the body depends upon the tract which has been infected.

## INFECTION

Infection results from disease-producing organisms entering and multiplying in the body. They produce two injurious effects:

1. They destroy tissue, as in an abscess that forms.
2. They excrete poisonous wastes, as in diphtheria.

Whether or not infection *will* actually occur after bacteria enter the body depends upon:

1. The path by which the bacteria enter. Typhoid bacilli, for instance, must enter through the gastrointestinal tract in order for the disease to result.
2. The number of bacteria which enter the body. A few bacteria are not as dangerous as a great many, other factors being equal. A few may be more easily overcome by the body defenses.
3. The virulence, or the power of the bacteria to produce disease. Those which have been weakened may be destroyed before they can produce disease.
4. The effectiveness of several means of protection possessed by the body.

**Protections of the body.** The body can protect itself against bacteria by:

1. The skin, because it is thick and also because it secretes a fatty substance which is antiseptic
2. The mucous membrane, which lines the various openings of the body; this membrane holds bacteria on its surface until they are washed out by the mucus
3. The tears, which are slightly antiseptic and can wash away, mechanically, both dirt and bacteria
4. Some secretions of the body which destroy certain bacteria, as the gastric juice and bile
5. The temperature of the body, which is unfavorable to the growth of certain bacteria
6. Lack of free oxygen in the body, without which some bacteria cannot live

How the blood protects us from disease. The white blood corpuscles can assume different shapes and pass through the walls of the blood vessels They rush to the site where bacteria are lodging and engulf them

Most important of the body's defenses is its formation of substances, known as *antibodies*, with which it fights harmful bacteria and their wastes (*toxins*) The blood forms specific antibodies which neutralize specific bacterial toxins

## IMMUNITY

Immunity means being free from the risk of infection The immune person can resist disease because he has either (1) natural immunity or (2) acquired immunity

Natural immunity is inborn Because of it some persons never contract certain diseases Besides, most human beings are immune to some animal diseases However, natural immunity alone is not an adequate defense against disease

Acquired immunity may be obtained in two ways

1 By recovery from the disease, because the body has manufactured its own antibodies to fight the disease, sometimes such immunity is lasting, as in measles, mumps, whooping cough, and typhoid, sometimes it is of short duration, as in influenza and pneumonia

2 Artificially, by either active or passive immunization

Active immunity. In this form of immunity the body itself is stimulated to fight the disease by the introduction into the body of an immunizing substance which, when injected into the body of a susceptible person, may produce antibodies This *antigenic* substance may consist either of living or dead bacteria or of the poisonous substances which bacteria excrete (their toxins) These substances are weakened by laboratory methods so that they will not cause disease But they are able to stimulate the body to form antibodies In each disease for which antigens are given, the body produces a specific antibody For example, typhoid vaccine is given to protect against typhoid fever *It is* because the body produces its own antibodies to fight the disease that the resulting immunity is called active

Both *vaccines* and *toxoids* are antigens A vaccine may contain either living or dead bacteria A toxoid consists of weakened toxins

Passive immunity. The antibodies which have previously been developed in the body of an animal are afterward prepared for human use and injected into the body of a patient in the form of a serum or antitoxin. Since his body is not active in the manufacture of the antibodies, the resistance which he builds up is known as passive immunity. This type of immunity is of relatively short duration.

## *SUMMARY*

Although microorganisms have but one cell, they, like all other living beings, take in nourishment, excrete wastes, and reproduce their kind. Some are animals, some are plants, and some fall in between and are generally classed as plants. Microorganisms are so small they cannot be seen with the naked eye, yet they pervade our entire environment except those limited areas which have been made sterile.

Some microorganisms are useful, some are even essential to life, but others are the deadly enemies of mankind. The chief groups of microorganisms comprise molds, yeasts, protozoa, viruses, and bacteria. They tend to multiply rapidly under the favorable conditions of warmth and moisture, but they vary in the method of reproduction, some reproducing by division, some by budding, others by reproducing sexually.

Because some microorganisms cause disease, those who care for the sick should know which organisms cause disease and how such disease may be prevented.

Pathogenic bacteria may be transmitted by vehicles and by vectors. Bacteria may enter the body by four avenues: the respiratory, alimentary, and genitourinary tracts, and abrasions of the skin. Bacteria destroy tissue and excrete poisonous waste. They leave the body in its excretions.

The blood offers some protection from disease in its white corpuscles and its formation of antibodies that fight bacteria. Moreover, the body enjoys two kinds of immunity: natural and acquired. Since natural immunity, however, is not sufficient protection, we have come to rely more and more on acquired immunity. Immunity

may be acquired in two ways by recovery from disease and artificial means (either active or passive)

The substances introduced into the body to give artificial immunity include vaccines, toxoids, and serums

## Questions

1 Why are microorganisms of great practical importance?
2 What three functions are performed by all living things?
3 Name several kinds of microorganisms Specify which are plants and which are animals
4 What are some of the diseases caused by viruses?
5 Discuss briefly the relation of microorganisms to food
6 Name a disease produced by protozoa
7 Discuss the colorless plants What are they called?
8 What are spores of microorganisms?
9 Discuss useful molds Why have they become especially important in recent years?
10 Name two skin diseases caused by harmful molds
11 What is meant by reproduction by budding? Name one type of microorganism which reproduces this way
12 What are wild yeasts?
13 Discuss fermentation
14. Name three types of bacteria On what basis are they divided into these three groups?
15 How are some bacteria able to move?
16 What changes do bacteria cause in food as they perform their three natural functions?
17 What are bacteria called that feed on living animals?
18 Of what is a culture made? How may a culture be used in the diagnosis of a disease?
19 What is the characteristic way in which bacteria reproduce?
20 What two conditions check the multiplication of bacteria?
21 Why is it important to know about spores when measures are being taken to destroy bacteria?
22 What is the name of the class of bacteria which depends on oxygen in the air to live?
23 What do we call those which cannot live when free oxygen is present?
24 Discuss the effects of moisture and light on the survival of bacteria

25. Discuss useful bacteria. What is their relation to (a) vegetable decay? (b) soil? (c) food?
26. Name some foods whose manufacture depends on the action of bacteria.
27. Name some industrial uses of bacteria.
28. Name several ways in which bacteria may be transmitted.
29. What is meant by droplet infection?
30. How can bacteria be transmitted by indirect contact?
31. Name some vectors by which bacteria are carried from an infected person to another individual.
32. Name some vehicles by which bacteria may be transmitted.
33. What is meant by a human carrier?
34. By what four avenues may bacteria enter the body?
35. How do bacteria leave the body?
36. What two injurious effects result from disease-producing organisms entering and multiplying in the body?
37. What four factors determine whether or not infection will actually occur after bacteria enter the body?
38. Name six ways in which the body can protect itself against bacteria.
39. How can the blood protect the body through the following: (a) White blood corpuscles? (b) Antibodies?
40. What does immunity mean?
41. What are the two chief kinds of immunity?
42. Under which classification does "recovery from the disease" belong?
43. Under what classification does artificial immunization come?
44. What two kinds of artificial immunity are there?
45. Of what does an antigenic substance consist?
46. What is the difference between an antitoxin and a vaccine?
47. From what is a serum prepared?
48. Does the effect of a serum last longer or shorter than the effect of a vaccine?

# 53

# DESTRUCTION OF BACTERIA

The more we study microorganisms, particularly pathogenic or disease-producing bacteria, the more we realize that we must use our combined efforts to fight these enemies. The scientist's findings must be supported by the constructive cooperation of the nurse in the hospital or in the home. She is constantly faced with the necessity of destroying harmful bacteria in the patient's environment and in preventing the spread of communicable disease. To be effective she must become acquainted with the terms used in this study and with the practical agents with which to fight pathogenic microorganisms.

Before considering some of the ways of destroying harmful bacteria and other microorganisms, the nurse should learn the meaning of the following terms.

*Asepsis* is the name given the procedure by which hands and articles are made free from bacteria. An aseptic wound or dressing is one from which microbes are absent.

*Sepsis* is the toxic state produced by the poison of the bacteria. A septic wound or dressing is an infected one.

*Sterile* means that an object or area is absolutely free from bacteria.

*Sterilization* is the removal or destruction of bacteria.

*Infection* means that bacteria or other microorganisms have entered the body and have caused injury to the tissues.

*Disinfection* is the method employed to kill disease-producing bacteria. Chemical agents, called disinfectants, are usually employed.

*An antiseptic* is an agent used to check or prevent the growth of bacteria. It does not always kill them.

The same agent may be a disinfectant in a strong solution or an antiseptic in a weak one. That is, it may be strong enough to kill the bacteria or be of sufficient strength only to check their growth.

*A deodorant* is an agent used to destroy odors. It has no effect on bacteria.

*A germicide* is an agent which kills microorganisms.

## *AGENTS FOR FIGHTING BACTERIA*

In the fight against bacteria, we avail ourselves of three types of agent: mechanical, physical, and chemical.

### MECHANICAL MEANS

Mechanical methods of sterilization include (1) scrubbing, (2) filtration, and (3) sedimentation.

Scrubbing is both a mechanical and chemical means of removing bacteria, since it generally combines friction with some chemical agent, like soap. The addition of the proper chemical to the water can result in scrubbed surfaces being made surgically clean. Scrubbing of surfaces should be done strenuously, using a firm-bristled brush. Floors and clothing are scrubbed to remove stubborn dirt. Scrubbing is considered an effective way of cleaning.

Filtration and sedimentation are the two other mechanical means used to remove or destroy bacteria. They are employed chiefly in connection with the purification of the water supply. (See Chap. 4, "The Practical Nurse: Her Duties to the Community.")

### PHYSICAL MEANS

Heat is the chief physical sterilizing agent. Sunlight and both dry and moist heat are employed.

Sunlight. The direct rays of the sun will kill bacteria when bedding, mattresses, clothing, and many other things are exposed to

it for a certain length of time The germicidal power of sunlight is in the violet rays Although sunlight has the general effect of inhibiting bacterial growth, the amount of sunlight required varies and is unpredictable

Heat is artificially produced in three ways boiling, steam under pressure, and hot air

Boiling is one method of sterilization Some bacteria which do not form spores are killed after ten minutes of boiling, but others may require a longer time Spore forming bacteria are more resistant to heat and require autoclaving, or steam under pressure Articles to be sterilized are placed in boiling water, they are completely covered by the water, which is kept boiling continuously the required length of time This method is useful in disinfecting such articles as bed linen, handkerchiefs, gauze, basins, dishes, and instruments

Steam under pressure This method is used in hospitals to sterilize articles which cannot be used wet, such as gauze, dressings, surgeons' gowns, sheets, and the like The articles are carefully wrapped in a double thickness of unbleached cotton cloth, then the packages are placed in an autoclave, where they remain for a specified time exposed to steam under pressure at 250°F (121 1° C ) From 15 to 20 pounds of pressure kills all bacteria, including spores

Hot air Sterilization by hot air is done by placing the articles, such as powders, ointment, glassware, needles, and sharp instruments in a heated compartment and keeping them at a temperature of 300° to 320°F (149° to 160°C ) for one hour (Paper and cloth will scorch at this temperature )

Pasteurization This method, introduced by the famous Louis Pasteur, checks the growth of all bacteria in milk and other liquids, but does not kill those which form spores It must not be confused with sterilization, a process which kills all bacteria including spores The liquid to be pasteurized is raised to a temperature of 142 5°F (61 4°C ), and kept at this temperature for 30 minutes, or 161°F (71 6°C ) for 15 seconds It is then rapidly chilled to a temperature of 50°F (10°C ), and kept cold (See Chap 20, "Food Lessons")

Burning Articles which can be destroyed after use, such as dressings, paper tissues, sputum cups, and the like, are disposed of by burning Patients should be asked to use paper tissues to remove discharges from the nose and mouth, and to place them in a paper

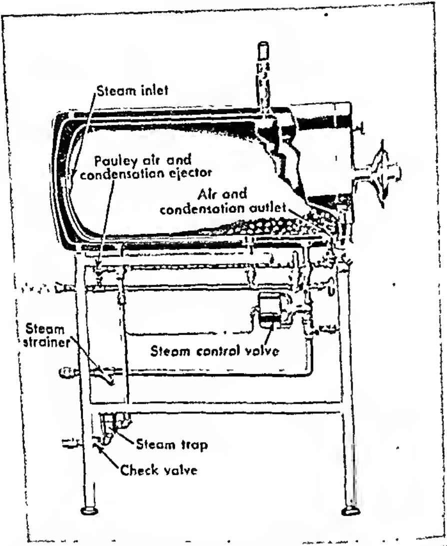


FIG. 49. Autoclave. Phantom view showing steam flow through sterilizer. Note the steam inlet and the air and condensation outlet and ejector. (Ohio Chemical Company. Courtesy of Medichrome-Clay-Adams, New York, and Thompson, LaVerne Ruth: *Introduction to Microorganisms,* W. B. Saunders Company, Philadelphia, 1949 )

bag pinned to the bedside. The paper bags should be collected at intervals for disposal by burning.

Cold. Cold retards the multiplication of microorganisms and for this reason food, some drugs, and biological products such as serums are stored in the refrigerator.

## CHEMICAL AGENTS

Many chemical agents in the form of solutions are used to destroy bacteria or to check their growth

Solutions A solution is a liquid containing a dissolved substance that cannot always be seen The strength of a solution depends upon the amount of dissolved substance which a certain amount of fluid contains For example, a 10 per cent solution means that 1 part of the chemical agent is used to 10 parts of solution A solution of 1 to 1000 means that 1 part of the chemical agent is used to every 1000 parts of solution The effectiveness of the solution depends upon its strength and upon the length of time the material to be disinfected remains in the solution

A *saturated solution* is one in which the solution contains as much of the chemical agent as it can possibly dissolve

*Choice of solution* In choosing the chemical agent to be used, the purpose, cost, and efficiency should be considered Almost all chemicals are strong poisons and should be used only as ordered by the physician

In the hospital, solutions are put up in the required strength In the home, the nurse will dilute the drug to the required strength by following the directions on the bottle or by asking the physician for instructions It is safer, however, to have the druggist prepare the solution in the desired strength

A few of the chemical agents commonly used are Formalin, lime, alcohol, isopropyl alcohol, Zephiran, iodine, sodium chloride or table salt, the coal tar derivatives, phenol or carbolic acid, and Lysol or Creolin, the mercury salts, corrosive sublimate, Merthiolate and Metaphen

Formalin is a solution of formaldehyde gas in water It is very irritating to the mucous membrane It is used to disinfect instruments

Lime is a whitish substance somewhat soluble in water It must be kept in a tight container, as some of its properties are lost when exposed to the air Fresh lime mixed with water about four times its weight is known as milk of lime and is useful to disinfect feces To make chlorinated lime solution, use 6 oz of lime to 1 gal of water When more than four parts of water are added, it is known as white wash and is a useful disinfectant on the walls of buildings

Alcohol has a limited use, as in a strong solution it coagulates albumen, the action is slow, and it is expensive. In a 60 to 70 per cent solution it is used to disinfect the hands, skin, thermometers, and glass syringes.

Isopropyl alcohol is used for rubbing compounds, back lotions, and sometimes as a skin disinfectant.

Zephiran is a cleansing and disinfecting agent which gets very close to the skin, thus being able to remove more than the usual amount of dirt and bacteria. Since it does not mix well with soap, all areas should be carefully rinsed before Zephiran is applied. Solutions of different strengths are used for wet dressings, instruments, and rubber goods.

Iodine is a substance dissolved in alcohol. Preparations of iodine are used externally, usually in a half-strength solution, for disinfecting wounds and for preparing the skin for surgical operations. It stains the skin and linen and, if used in a strong solution, will burn the tissues. Iodine may be removed from the skin by an application of alcohol.

Sodium chloride, or table salt, is a white crystalline substance, soluble in water. Normal salt solution, made by dissolving 1 dram (equivalent to 1 level tsp of salt) in 1 pint of water has some of the same characteristics as blood. Properly prepared under aseptic conditions, therefore, normal saline solution can be introduced into the body when a great deal of blood has been lost. It has a mild antiseptic action and is used for irrigating enemas and to cleanse wounds.

Coal-tar derivatives. *Phenol, or carbolic acid,* is a dangerous poison. A strong solution will destroy tissues by burning. Burns of the skin may be treated with alcohol. In a weak solution, phenol is an antiseptic. It is used to disinfect bed and body linen, instruments, utensils, sinks, and toilets. It is expensive. For home use the druggist will prepare the solution in the strength ordered by the physician.

*Lysol and Creolin* are also coal-tar derivatives. In strong solutions both are injurious to tissues. They are less expensive than carbolic acid and safer to use.

Mercury salts. *Corrosive sublimate, or bichloride of mercury,* is prepared in tablet form. Though it is an effective disinfectant even in weak solutions and very cheap, it is dangerous to use. A strong solution should not be used on the hands. It is sometimes used to

disinfect glassware and thermometers in a strength of 1 1000 It is useless for body discharges, as it coagulates albumen—that is, it forms a protective coating over the material to be destroyed It can not be used to disinfect metals because of its corrosive action

*Merthiolate and Metaphen* are preparations of mercury They are not irritating to the skin and are largely used in place of iodine in a 2 per cent or a 5 per cent solution

## METHODS OF DISINFECTION AND STERILIZATION

Disinfection of bedpans and urinals Bedpans and urinals may be soaked one hour in a solution of chlorinated lime (6 oz of lime to a gallon) Many hospitals have automatic equipment for sterilizing bedpans and urinals

*Disinfection of thermometers on termination of case.* Soak thermometers for 12 hours in a covered dish containing 70 per cent alcohol The thermometers must be completely covered by the alcohol Wash in cold soapy water and return to clean thermometer glass or container

*To sterilize small instruments before using for a dressing.* Place instruments in cold water, bring to a boil, and boil for 10 minutes Soda, if added to the water, will prevent the instruments from rusting Instruments with a sharp edge should be wrapped in gauze before placing in the water Pour off the water carefully without touching inside of container, then remove cover for a few seconds to allow escape of steam to prevent the rusting of instruments

*Aftercare of small instruments* Wash thoroughly in cold water, then in hot soapy water, and rinse with hot water Dry carefully If the instruments have been used in a dressing where pus is present, it is necesary to boil them before putting away Wash as usual before boiling, but be careful to dispose of the soiled water by throwing it down the hopper or toilet In the home, this water should never be emptied in the kitchen sink

*To disinfect rubber goods* Wash hot water bottles, ice bags, and rubber rings in soap and water, rinse, and dry carefully Rubber sheets should be washed with soap and water, rinsed, and dried by hanging in the sun, they should be turned once in order to sun both sides Roll on sticks to prevent cracking

To disinfect rubber tubes and catheters, boil them for five

minutes; add salt to water to keep the rubber firm. They should always be hung up to drain before being put away.

When gloves have been used on an infectious case, they are boiled before being cleaned. (Never add salt to water in which gloves are boiled as it destroys their flexibility.)

## *SUMMARY*

The nurse is constantly faced with the necessity of destroying harmful bacteria. She needs a basic knowledge of terms before she starts her study.

Three types of agents for this purpose are available: mechanical, physical, and chemical.

The mechanical agents include: scrubbing, filtration, and sedimentation.

Heat—dry or moist, or sunlight—is the chief physical agent. It includes boiling, steam under pressure, hot air, pasteurization, and burning.

Cold retards the multiplication of bacteria.

Many chemical agents in the form of solutions are employed, each with its specific values and possible dangers in overstrong solutions. The coal-tar derivative, phenol, is a dangerous poison and requires definite precautions in its use.

In the hospitals sterilization of much equipment is done by others than the nurse, but in the home it is her responsibility. Therefore she should know approved methods and their adaptation to the home, not only so that bacteria may be destroyed, but also so that the articles being sterilized will not be damaged by the process used. Rubber goods, in particular, require specific methods to ensure the best results.

Questions

1. Define *antiseptic, asepsis, deodorant, disinfection, germicide, infection, sepsis, sterile, sterilization.*
2. What three types of agent are available to fight bacteria?
3. Discuss the scrubbing of surfaces.
4. In what field are filtration and sedimentation employed to remove or destroy bacteria?

5 What is the effect on bacteria of direct sunlight?
6 In what three ways is artificially produced heat used?
7 Describe sterilization in an autoclave
8 Describe pasteurization What is its purpose?
9 What articles should be destroyed after use by burning?
10 How are some drugs and antibiotics stored to retard the multiplication of microorganisms?
11 Define *solution*
12 Explain "a 10 per cent solution," "a solution of 1 to 1000," "saturated solution"
13 How can the nurse in the home make sure of getting the solution of the desired strength?
14 Name several chemical agents commonly used in solutions
15 What is formalin used to disinfect?
16 What danger is there in using too strong a solution of iodine to disinfect wounds or to prepare the skin for surgical operation?
17 What is phenol, or carbolic acid, used for? Discuss the dangers involved in its use.
18 What disinfectant is mentioned in the text as useful for disinfecting thermometers and glassware?
19 What is a practical method for sterilizing small instruments?
20 Discuss in detail the approved methods of disinfecting rubber goods

# 54

# SOME COMMUNICABLE DISEASES: PREVENTION OF THEIR SPREAD

A communicable disease is one which can be transmitted from one person to another, either directly or indirectly. Most communicable diseases run a definite course, which may be divided into four stages:

1. Incubation, or the period between exposure to the disease and the appearance of the first symptoms
2. The onset, when the first symptoms appear
3. The active stage of the disease
4. Convalescence, or period of recovery

The two main factors in caring for communicable diseases are to help the patient get well by building up his resistance and to protect ourselves and others from contracting the disease. The nursing care differs according to the type of the disease and the symptoms.

Such communicable diseases as syphilis, scarlet fever, measles, diphtheria, erysipelas, meningitis, typhoid fever, and malaria in the acute stages are not within the scope of a practical nurse (unless she is working as a member of the nursing team). Some knowledge of their symptoms is, however, essential for anyone concerned in the care of the sick, as these diseases may occur at any time and in any household. The practical nurse should recognize early symptoms of the conditions and isolate the patient until she is relieved of the responsibility of the case.

The nursing care of whooping cough, chickenpox, mumps, German measles, influenza, and tuberculosis is within the scope of a practical nurse, and their symptoms and treatment are therefore discussed Even in these diseases the patient may be quite ill and the complications serious, therefore, it is important to observe the patient's conditon closely and to carry out all precautions

## *SYMPTOMS AND TREATMENT OF SOME COMMUNICABLE DISEASES*

### LESS SERIOUS COMMUNICABLE DISEASES

**Whooping cough, or pertussis,** is caused by bacilli that lodge in the mucous membrane of the bronchi It is spread by direct and indirect contact with nasal discharge, vomitus, and coughed-up material, all of which contain the bacilli A person who has once had the disease is usually immune to reinfection

The incubation period is from 5 to 14 days The disease begins with what seems to be an ordinary cough There is no temperature elevation After about ten days appear paroxysms of cough followed by the characteristic whoop The patient usually feels well between the paroxysms, which may vary in frequency from 5 to 50 in 24 hours A typical paroxysm starts with a series of explosive coughs followed by a crowing sound or whoop, caused by breathing in through a narrowed *glottis* The patient may vomit during or following the cough, especially if food has just been taken

The infectious period of whooping cough is usually over in five *or six weeks, but the child may whoop occasionally for many months,* especially if he has a cold

*Treatment* consists in isolating the patient to prevent spreading of the disease, trying to avoid paroxysms, and keeping up the patient's nutrition It is safer for the small child to sleep in a crib with the sides up to prevent falling out during an attack of coughing Patients are kept out of doors as much as possible, since they usually have fewer paroxysms in the open air The spray produced in coughing may travel many feet The patient should be kept at a safe distance from other people

The taking of food may bring on a paroxysm causing the patient

to vomit what has been eaten. To see that the child has adequate nourishment is a problem which usually requires patience and ingenuity to solve. Often, if the patient has a paroxysm just after eating and vomits, another meal given immediately may be kept down. It should be remembered that the vomiting in whooping cough is mechanical and not due to indigestion. If a baby starts to choke during a paroxysm, he may be held by his heels and his mouth cleared with a piece of gauze. It is now considered good practice as a preventive measure to vaccinate children between the ages of 6 months and 2 years. A booster dose of vaccine may be given to a child who has been vaccinated if he has been exposed to this disease, or when he first enters school.

Chickenpox, or varicella, is caused by what is known as a filterable virus (an organism so small that it cannot be seen under the microscope and can pass through certain types of filters). It is a very contagious disease which is spread by direct contact with the patient and by indirect contact with articles freshly contaminated with discharges from the nose, throat, and vesicles (a small skin blister). One attack usually protects an individual against any further attacks.

The incubation period is from 14 to 21 days, most commonly about 17 days. At the onset there may be a little fever, vomiting, and general malaise, but these symptoms do not last. A rash appears during the first 24 hours, consisting at first of small papules, like insect bites, which later change to vesicles filled with fluid. If these are secondarily infected by scratching, they become filled with pus and are then called pustules. After three or four days the vesicles become scabs, which may remain several weeks. The eruption appears in crops, so there may be vesicles in one place, pustules in another, and scabs in still another at the same time. The most troublesome symptom is itching, which is often hard to control.

*Treatment.* The patient is isolated and rests in bed until all the primary scabs have disappeared, usually about ten days. Lotions to allay itching are used. It is important to prevent the patient from scratching as this may lead to permanent scars on the skin. The patient is given a daily bath (omitting soap if it is irritating). A soothing ointment is usually prescribed. Certain antibiotic drugs have been found effective.

Mumps, or epidemic parotitis The cause of mumps is a filtrable virus It is transmitted by contact with nose and mouth secretions A second attack is rare

The incubation period is usually from 17 to 21 days At the onset there may be general symptoms such as fever, lack of appetite, pains in the back and legs If these are present, they may last from 12 to 48 hours, but they may be entirely absent Then there is usually pain behind one or both jaws under the ears followed by swelling of one or both parotid glands This swelling may last a week or ten days During this time, sour or acid foods may cause intense pain in the affected glands Sometimes, particularly in adolescent boys, there may be a swelling of one or both testicles

*Treatment* Isolation is maintained for three weeks While there is fever and much swelling, the patient is kept in bed If pain is very troublesome, hot or cold applications to the neck may give relief Frequent cleansing of the mouth is important

German measles, or rubella The cause of German measles is a virus found in the nose and mouth discharges It usually occurs in epidemics and is thought to spread by direct contact—kissing, sneezing, and coughing—and by indirect contact with articles contaminated with discharges from the nose and mouth

The incubation period is from 14 to 21 days The general symptoms are mild There is a rash consisting of small pale red spots Usually there is a swelling of the lymph nodes at the back of the neck The temperature does not often exceed 101°F (38 3°C ), and the disease lasts only a day or two

*Treatment* Isolation is generally required While the patient's temperature is high he should be kept in bed and given a liquid diet

German measles is usually a disease without complications but if it occurs in a woman during the first months of pregnancy it will usually produce malformation of the fetus resulting in deformity, especially of the eyes and heart

Influenza This term is used loosely to include any severe infection of the respiratory system Strictly speaking, it should be limited to disease caused by the influenza bacillus It causes a very serious form of meningitis in infants The primary cause is a filtrable virus, but it may be associated with a complicating virus

The type of influenza known as the epidemic form is very contagious, the spread being by direct contact with the discharges from

the nose and throat, and from the spray of droplets when the patient coughs and sneezes. Kissing should be strictly avoided. It is also spread by indirect contact with articles freshly soiled by discharges from the patient's mouth and throat.

*Symptoms* are usually more general than local. The onset is apt to be rather abrupt, with chilly sensations or a shaking chill, pains in the muscles, and extreme prostration. There may also be a dry hacking cough, sore throat, and redness of the eyelids. The duration of the disease is usually three to four days as far as the fever is concerned, but the prostration may last considerably longer, and pneumonia may develop. Convalescence is slow.

*Treatment* is that of any acute febrile disease: bed rest, fluids, and a light diet. Often the muscle pains are so severe that sedatives are ordered. Isolation is advisable, particularly during an epidemic.

## MORE SERIOUS COMMUNICABLE DISEASES

Syphilis is caused by an organism of the spirillum group, and is found in all parts of the world having contact with civilization. Its prevalence varies with the racial and social composition of the community. It is usually transmitted by sexual intercourse, but it may be acquired if a broken skin surface comes in contact with one of the moist lesions of the disease. If the mother has syphilis and is untreated, it is transmitted to the fetus in the uterus, and the baby is diseased at birth. This is called congenital syphilis.

*Symptoms* of syphilis are usually divided into three stages. In the primary stage there is a sore (called a chancre) occurring at the site where the organism gains entrance to the body. The secondary stage is marked by a generalized rash and often enlarged lymph nodes. In the tertiary (third) stage the disease may attack almost any organ of the body, the symptoms of course depending upon the organ affected. Sometimes the first two stages are so mild that they are not noticed, and the patient may have no idea that he is infected until it shows up in the heart, nervous system, or other organs years after the disease may have been acquired.

The diagnosis of syphilis can be made in the very early stages by microscopic examination of the material obtained from the sore, since the organisms are present in great numbers in the chancres.

In the primary, secondary, and tertiary stages the diagnosis is made certain by testing the patient's blood Various tests are known as the Wasserman, Hinton, Mazzini, and Kahn tests

*Treatment* Penicillin is used in various forms almost exclusively today

A patient with the disease harbors the organism in all but the very latest stages In the primary stage, when the rash is spread over much of the body, many things that the patient has touched may be contaminated and should be disinfected Dressings and disposable handkerchiefs should be burned

*Prevention* Syphilis can be prevented by education of the public to the importance of promptly reporting all cases, and by receiving early treatment

Scarlet fever is caused by a type of streptococcus that produces a poison or toxin The latter seems to be the direct cause of the rash and general symptoms As scarlet fever is very contagious, strict isolation is necessary as soon as the disease is suspected Scarlet fever is spread by direct contact One attack does not prevent a person from becoming infected with the organism but does usually prevent the effects of the toxin The incubation period is usually from two to seven days

The onset is accompanied by severe sore throat, headache, fever, general malaise, and, frequently, vomiting These symptoms are followed by the appearance of a fine red rash, which usually covers the entire body and lasts from three to seven days After this time the skin begins to peel off in a characteristic manner This process, known as desquamation, is usually completed in from one to three weeks Scarlet fever is a serious disease because of its complications, which may be many and severe

Measles The organism causing measles is probably a filtrable virus It is spread by direct and indirect contact and is most contagious especially in the early stages As the onset of measles so closely resembles a common cold, any child with running nose and eyes should be isolated until it is certain that measles will not develop One attack usually confers immunity

The incubation period is from 8 to 14 days The disease begins with a running nose and eyes, and a slight cough Fever is usually present About two days later the rash appears This consists of

dark red spots, which are irregular in outline and which appear first on the head and neck and gradually spread to the trunk and lower extremities. Itching is not likely to be present. The rash usually lasts about a week and is accompanied by a fever, sometimes with a temperature as high as 104°F. (40°C.). Measles is a serious disease in infants and young children, as in these cases it is often followed by pneumonia.

Diphtheria. The organism responsible for diphtheria is a bacillus known as the Klebs-Loeffler bacillus, which produces a powerful toxin. Since diphtheria is spread by direct contact with a patient or a carrier, through kissing, sneezing, or coughing, and by indirect contact with articles contaminated by discharges or by contaminated linen, rigid isolation is necessary. One attack usually confers a lasting immunity. The incubation period is from two to five days.

The onset may be mild, with a sore throat and a little fever. Gradually, the throat becomes more painful, and a membrane is formed that covers the tonsils and pharynx. This may extend to the larynx and cause obstruction to the breathing. The toxin formed by the bacillus often affects the heart, kidneys, and nerves. Prompt diagnosis, followed by early injection of antitoxin, will check the spread of the disease and tend to prevent complications.

*Prevention.* By means of the Schick test it is possible to determine whether or not an individual is susceptible to diphtheria. Injection of a diphtheria toxoid mixture will immunize a susceptible person against diphtheria. As this procedure takes several months, those in contact with a case of diphtheria, if such persons are found to be susceptible, are given antitoxin.

Erysipelas is caused by a streptococcic organism that produces a toxin. It is very contagious, and, like all streptococcal infections, has grave possibilities. The streptococci are in the skin lesions of the patient and can easily be conveyed by direct contact, and by indirect contact with contaminated articles. Strict isolation is necessary. The organisms gain entrance into the body by a cut or break in the skin.

The patient is always very sick with a high fever. Temperatures up to 105°F. (40.5°C.) are not uncommon, particularly in children. The fever may precede the appearance of the typical skin lesion, but usually the latter is the first thing to be noticed. This is a

dark red blotch, slightly raised, with an irregular raised border. The infection may spread so that it involves a large area, or it may be confined to one particular locality, most commonly the face.

Meningitis, a purulent infection of the membranes covering the brain and spinal cord (*meninges*), may be caused by a variety of organisms. Meningococcus meningitis is spread by direct contact, as in the early stages of the disease the organism is found in the nasopharynx of patients. In epidemics there are thought to be carriers who harbor and spread the organism without themselves having any symptoms.

The onset is usually abrupt, with headache, vomiting, high fever, and prostration. The most constant symptoms are pain in the back of the neck and along the spine, symptoms associated with a stiff neck and stiff back. There may be a skin rash consisting of small hemorrhages into the skin. This occurs when the organism invades the blood stream in the early stages of the disease.

Typhoid fever. This serious communicable disease is caused by the typhoid bacillus. The bacillus is harbored in the intestinal tract of patients, and carriers. Typhoid fever is contracted by eating food or drinking milk or water contaminated by infected sewage, by direct or indirect contact with infected persons, and indirectly by means of flies.

The first symptoms noticed are usually headache, fever which is at first mild, and, perhaps, diarrhea. Later the fever becomes high and stays high and is often accompanied by delirium. As the bacillus causes ulcers in the small intestine, there may be bloody stools and abdominal pain. Sometimes these ulcers perforate, thereby leading to severe peritonitis unless an operation is performed. The disease is of long duration, lasting many weeks, often with one or more relapses.

*Prevention.* An individual may be made immune for a limited time (about two years) by inoculations with typhoid vaccine.

Malaria is due to a parasite that invades the red blood corpuscles. It is transmitted through the bite of a certain type of mosquito called the anopheles mosquito, that harbors the parasite.

The symptoms are headache, chill, and fever occurring every day, every third day, or every fourth day, depending on the type of the malarial parasite causing the infection.

## TUBERCULOSIS

The practical nurse is frequently called to care for a patient with some form of tuberculosis. The following discussion is intended particularly to help her in the home situation.

Tuberculosis is an infectious disease caused by a microorganism, the tubercle bacillus, so called because of its tendency to form tiny lumps or tubercles. All parts of the body may be affected. In children, tubercle bacilli often produce meningitis (involvement of the membranes covering the brain or spinal cord) or disease of the joints or bones. In the adult, pulmonary tuberculosis is the common form of the disease. Other less prevalent types of the infection are tuberculosis of the kidneys, bladder, and lymph glands. The disease is spread by direct contact, such as kissing and droplet transfer, and by indirect contact with articles soiled by fresh secretions from the nose and throat.

There are two common pathways of infection by tubercle bacilli: inhalation and ingestion (eating and drinking) of the organisms. The former is the more common, since the practical eradication of tuberculosis from cattle has been attained. When the organism is inhaled, it locates in one of the finer air passages and sets up a local reaction in the lung. When the organism is ingested, it may pass through the intestinal wall and set up disease in one of the neighboring lymph glands. From either location, the organisms may multiply and spread to other parts of the body. Once the organism has acquired a foothold, a sensitivity of the skin to extracts of the organisms develops. This is the basis of the *tuberculin test*. A positive reaction to this test indicates that, at some time, the individual has been infected with the tubercle bacillus. It does not mean, necessarily, that the individual has the disease.

The vast majority of individuals infected with tubercle bacillus never develop any symptoms, but overcome the infection and never develop the disease. However, they carry a focus of the infection, which may under certain circumstances, at any time in life, be the starting point for active tuberculosis.

*The symptoms* of active pulmonary tuberculosis include fever, night sweats, loss of weight, malaise, cough, and expectoration. Blood spitting may occur. Once established, the course of the disease depends on several factors. In some people it runs a rapid fatal

course, because of low resistance, while in others the arrest of the disease may be brought about by the ability of the body to destroy large numbers of bacteria, and to heal the disease area with scar tissue The most important factor in bringing about an arrest of the disease is the patient's cooperation in carrying out treatment

Bed rest is fundamental in the management of pulmonary tuberculosis It may be strict at first, but relaxed later, as the patient shows improvement Bed rest is best carried out in a sanatorium, but circumstances often warrant management at home A well balanced high calorie, high vitamin diet is usually given In recent years, some drugs have been discovered which have an antibacterial effect and are helpful in the management of the patient Among these are streptomycin, PASA (para-aminosalicylic acid), and isoniazid These must be used over long periods of time, as determined by the physician

When something more than bed rest and drug treatment appears to be necessary, there are methods for both temporary and permanent collapse of one or both lungs, which may finally help to arrest the disease More recently, for certain cases, excision of diseased lung tissue has been resorted to with success

*The prevention* of tuberculosis is brought about by the isolation of patients who have the disease in a communicable state The expectoration, which is dangerous because it contains tubercle bacilli, should be carefully collected and burned The patient should neither kiss nor be kissed He should have separate dishes, which should be boiled after use, because they have been contaminated by sputum Children should be excluded from the patient's room because of their susceptibility to the disease, and because they disturb the patient's rest The patient should be taught how to dispose faithfully of his expectoration, or discharges from other involved organs It is well for the nurse to bear in mind that the tubercle bacillus may be destroyed by boiling for five minutes, or by exposure to 70 per cent alcohol, or by exposure to direct sunlight The bovine type of tuberculosis has been practically eradicated by the slaughter of tuberculin-positive cows Pasteurization of milk also removes the threat of tuberculous infection

Nursing care Since rest is the basis of all treatment for tuberculosis, the tuberculous patient usually starts treatment at *strict bed rest*, which may be relaxed to allow bathroom privileges at an early

date, providing there is no fever. The patient is usually in bed for weeks or months, so it is important to have a well-ventilated and quiet room with or without a sleeping porch. Sitting in a chair is not a substitute for bed rest. Fatiguing periods of conversation should be prohibited. Only a limited number of visitors should be allowed.

Fresh air seems to have some psychologic value. It is refreshing, and at times stimulating, but the patient does not have to be out of doors. Sufficient fresh air may be obtained by having the windows of the room open when the patient is sleeping, and for short periods in the morning and afternoon when the patient is not propped up for reading or for occupational therapy. If the patient is resting out of doors in a shaded place, he should be dressed comfortably warm. He should not be exposed to extreme cold.

Sunbathing is rather fatiguing and should be avoided in pulmonary tuberculosis. On the other hand, it seems to have had some therapeutic value for tuberculosis of the bones or joints. Sun treatment is given only when ordered by the physician. It is important to follow the temperature and weight of the patient closely, as these are the two factors by which progress may be measured.

*Prevention of infection.* As the bacilli are found in the sputum or in discharges from a gland or sinus in a bone, the following rules must be observed when a patient is cared for at home:

1. Sputum should not be swallowed. It should be received in a paper napkin or square of toilet paper, placed in a paper bag, and burned. The patient must cover his mouth when coughing.
2. Attach a paper bag to the side of the bed and place paper napkins or squares of toilet paper in a place convenient to the patient.
3. When dressing a discharging gland or bone, follow the same procedure as in any surgical dressing. All soiled dressings must be burned immediately. Do not allow sputum or discharges to become dry, for, when dry, the bacteria is carried around in the air. If unable to burn these materials, wrap them in several layers of newspapers.
4. Boil dishes and all utensils used by the patient and keep them in his room or in a separate place in the house.
5. Burn all food left over on the patient's tray, or discard it in the toilet.
6. Put soiled linen in a covered receptacle and boil it before sending it to the laundry.

7 Cleanse the patient's toothbrush with warm water and soap, rinse in hot water, and expose it to the *direct* rays of the sun

8 After bathing the patient and after cleaning his teeth, empty the used water in the toilet (never in the kitchen sink or lavatory bowl)

9 Patient must put nothing except food and his toothbrush in his mouth

10 The patient's hands must be washed frequently and always before meals

11 For her own protection and to prevent the spread of disease by infected secretions, the nurse should carry out medical aseptic procedure when caring for a patient with active pulmonary tuberculosis

## *PREVENTING THE SPREAD OF COMMUNICABLE DISEASE*

The practical nurse has some knowledge of microorganisms and knows how to prevent the growth of bacteria and how to destroy them If a sign "Danger! Bacteria at work!" could flash automatically over all waste matter, such as body discharges, soiled dressings, and the like, it would warn the nurse that she is handling unsafe material

Her hands are the contact between this unsafe or "dirty" material and what is clean She removes a bedpan, does a dressing, then prepares and serves a tray, using the same two hands She prevents carrying disease to the patient or away from him only by thoroughly washing her hands before and after carrying out a procedure or treatment, and after disposing of waste material This practice of handwashing and the effective disposal of waste are the nurse's part in medical asepsis

### MEDICAL ASEPSIS

Medical asepsis means controlling the transfer of pathogenic (i e, having the capacity to produce disease) organisms from one person to another as far as possible The nurse is always careful about washing her hands and disposing of waste, so that she is always prepared to prevent the spread of communicable disease.

Otherwise, the greatest risk of spreading such disease is before the disease has been diagnosed.

Isolation. As soon as the doctor diagnoses a communicable disease, the patient should be as completely isolated as possible. Isolation means that the patient is separated from others, and that certain precautions are observed in handling everything necessary for his care. All articles that have been in contact with the patient must be disinfected after use so as to destroy disease-causing bacteria and thus prevent their spread. Disinfection is termed *concurrent* when it is done immediately after use of an article, as dishes and linen. It is called *terminal* when it is done after the period of contagion is over, as with furnishings in the patient's room.

In the hospital there are special routines for setting up an isolation or precaution unit. In the home, the nurse is responsible for arranging a room for the patient and for carrying out precaution measures in a safe way for the patient and his family. The following plan for a home setup for communicable disease is suggested.

A room is chosen for isolation of the patient as near as possible to the bathroom. All articles belonging to other members of the family are removed from this room. The nurse may explain that for their own protection all visitors and members of the family, especially children, are to stay out of the room.

All articles needed for patient care are assembled in the room. An attractive tray for meals and salt and pepper shakers are left in the room. A gown for the nurse and a place near the door to hang it are provided. In the bathroom, the nurse arranges her personal handwashing equipment of soap, paper towels, and hand lotion away from other articles. Handwashing is the most important measure in preventing the spread of communicable disease. A generous supply of newspapers is put in the bathroom for care of the bedpan and for wrapping waste. In the kitchen a dishpan or a large basin is needed for boiling dishes, and a wash boiler or other large container for boiling linens. A supply of newspapers should be stacked ready for use. A waste pail always should be available.

Handwashing. The nurse washes her hands under running water. The hands are first wet so that the soap will lather freely. Then, using friction, she rubs well between the fingers and around the nails, over the back and palm of first one hand and then the other. She rinses the hands well, holding them pointing down over the

basin She repeats the soaping, rubbing, and rinsing, as the second washing removes the more resistant dirt She always rinses and then dries her hands well, preferably with paper towels which can be discarded Wet hands or dried soap on the skin may cause chapping or breaks in the skin which can admit infection

If running water is not available, the nurse provides a basin, pitcher, and a pail for waste She may ask a member of the family to pour water over her hands from the pitcher, or manage it herself by holding the handle with a paper towel when her hands are soiled

If it is necessary for the nurse to touch anything outside the sickroom, she covers her hand with a paper towel

**The sickroom gown.** The nurse always puts on a gown in the patient's room before giving close care In the hospital the "discard" technique, where a fresh gown is put on each time, is frequently used, but it is impracticable in the home A coverall apron with short sleeves may be used It is put on and removed like the gown

With clean hands, slip the hands and arms into the sleeves without touching the outside of the gown, which will be next to the patient Fasten it at the neck, keeping the hands inside the neckband, fasten or tie the belt in back so that the gown will lap over the edges in back To remove the gown, unfasten or untie the belt Then wash the hands Unfasten the gown at the neck, touching only the inside of the neckband The nurse may now slip her arms and hands out of the sleeves and, with her fingers in the armholes, fold the gown with the shoulder seams together, so that the inside of the gown is not exposed Keeping her hands still inside the gown, she hangs it over a hook, so that her hands may be slipped out without touching the outside It will be ready to put on again without touching the hands to the outside She then washes her hands again

**The mask.** When the patient has an acute upper respiratory, droplet-borne infection, the nurse wears a mask A clean mask is worn each time, and is put on before the apron or gown It should cover the nose and mouth to be effective *Masks are never kept on after they become damp,* as they would then be a focal point for bacterial growth The mask should be removed after the apron has been taken off, and the mask should be placed in the container for laundry Gauze masks may be made of at least four thicknesses; disposable masks of heavy paper may be made or purchased The


FIG. 50A. Putting on a gown in medical asepsis: *1*, getting the hands and arms into the sleeves, touching only the inside of the gown; *2*, drawing the neck of the garment into place, touching only the inside of the gown; *3*, fastening the gown at the back; *4*, *5*, *6*, lapping the back edges of the gown, drawing the belt ends into place and fastening them while the lapped edges are held in position; *7*, the gown with back and belt fastened. (Harmer, Bertha, and Henderson, Virginia: *Textbook of the Principles and Practice of Nursing*, 5th ed. The Macmillan Company, New York, 1955 )

nurse may cover her hair with a large cotton bandkerchief or a triangle while she is in the sickroom.

Linen. Soiled linen is placed on a newspaper on the floor, rolled up, wrapped in heavy clean papers or put in a laundry bag. The outside of the bag is kept clean by placing the bag on a newspaper, folded back on itself, with care being taken not to touch the outside except with clean hands. The bag is specially marked, if arrangements have been made for the laundry to be done commercially. If the linen is laundered at home, the nurse takes the bag to the laundering area and empties the linen into the wash boiler. She


Fig 50B Removing a gown in medical asepsis *1*, unfastening the neck of the gown after washing the hands, *2*, drawing off the first sleeve by slipping the finger under the cuff; *3*, drawing the second sleeve off by grasping it through the first sleeve, *4*, the gown hung on a standard with the shoulder seams together and only the contaminated outer surface exposed (Harmer, Bertha, and Henderson, Virginia *Textbook of the Principles and Practice of Nursing*, 5th ed The Macmillan Company, New York, *1955*)

covers the linen with cold water and boils it 20 minutes; then washes and dries it as usual. By using two bags, the soiled bag can be boiled with the linen.

Dishes. To care for dishes after meals are finished, the nurse pours any liquids remaining into the waste pail. She scrapes solid food into a paper or newspaper bag for waste disposal, with the aid of soiled paper napkins and doilies. All dishes and silver are placed on metal or enamelware trays; the bed tray is left in the patient's room. The nurse takes the tray to the kitchen, places it on newspaper-covered area, puts dishes in cold water in the container provided for boiling, then boils 20 minutes Dishes may then

FIG. 51. Pictures made by high speed photography showing the atomization of droplets into the air during a sneeze. *Upper photograph*: a violent, unstifled sneeze. Note that most of the material comes from the mouth, rather than from the nostrils. *Lower photograph*: an unstifled sneeze of a person with a head cold. Note the larger-sized droplets and the strings of mucus (From Jennison, M. W.: "Atomizing of Mouth and Nose Secretions into the Air as Revealed by High-speed Photography," *Aerobiology*. American Association for the Advancement of Science, Washington, D C., 1942.)

be washed and dried. (After placing the dishes in the boiler, with the tray on top, the nurse disposes of the newspaper and washes her hands.)

**Dressings, tissues, etc.** Discharges from the nose and throat, and sputum are always concurrently disinfected. Instruct the patient to discard wipes, tissues, and the like into paper bags provided for

FIG 52 A sneeze through a mask of a type commonly worn by surgeons and nurses. The picture was made by use of a special high-speed photographic technique, with an exposure of 1/30,000 of a second Droplets expelled from the mouth by the sneeze evidently passed through the mask, although most of them were held back, as can be seen by comparison with the heavy cloud of germ-laden particles sent into the air by an unstifled sneeze (Figure 51). It is evident, however, that even a mask as well made as this one (*which is thicker than most*) may not prevent droplet infection altogether. (From Jennison, M. W.: "Atomizing of Mouth and Nose Secretions into the Air as Revealed by High-speed Photography," *Aerobiology*. American Association for the Advancement of Science, Washington, D C , 1942 )

him, and to use each tissue only once. If a sputum cup is necessary, instruct the patient to expectorate into the cup. Sputum cups are put into the paper bag for disposal. Paper bags should be wrapped in newspaper if they are damp on the outside, and in any circumstances should be tied securely with string and discarded in the trash can or burned.

All soiled dressings and other waste material should be wrapped securely in newspaper and discarded in the trash can or incinerator. Wastebaskets should be lined with newspaper or paper bag.

Stools, urine, and vomitus may be emptied directly into the toilet while flushing if there is a local sewage system. In typhoid or infectious diarrhea it is advisable to disinfect the stools. Formed

FIG. 53 After each addition to the contamination pail, the contents are stirred thoroughly to ensure contact with chlorinated lime. (Courtesy of Medichrome-Clay-Adams, New York, and Bellevue Hospital, Department of Hospitals, City of New York.)

stools are broken up with a narrowly folded newspaper, which is then wrapped for waste disposal, and the stool is emptied into a covered pail, half full of 5 per cent chlorinated lime solution (8 oz to 1 gal water). It is allowed to stand at least one hour. Since lime solution deteriorates rapidly, it should be made up fresh.

Terminal disinfection is done when the period of contagion is over and the doctor orders isolation discontinued. The patient has a complete bath and a shampoo; if possible he is moved into another

room. The room he has occupied is thoroughly cleaned, using soap and hot water wherever feasible. Mattress, pillows, and rugs which cannot be washed are exposed to bright sunlight for at least six hours. This may be done on one or more successive days Books, games, and toys which are not washable should be sunned in the same way. After being cleaned, the room is aired for 48 hours.

All the precautions described are not necessary for every communicable disease. The doctor will indicate which precautions are to be taken to prevent the spread of the particular disease.

Quarantine is that period of time during whicb public health regulations control the movements of people ill with a communicable disease, or exposed to it. The doctor reports a communicable disease to the department of health, which then gives quarantine directions to the patient and his family. Local health department regulations vary in different communities and in different sections of the country.

## *SUMMARY*

Communicable diseases can be transmitted from one person to another. Most of them run a certain course which may be divided into four stages.

The two main factors in caring for patients with these diseases are to build up the resistance of the patient and to prevent the spread of the disease.

Some of these diseases in their acute stages are not within the scope of the practical nurse: syphilis, scarlet fever, measles, diphtheria, erysipelas, meningitis, typhoid fever, tuberculosis, and malaria; but a knowledge of their symptoms is of value to the practical nurse.

The diseases covered in this chapter, which are within the scope of the practical nurse, include: whooping cough, chickenpox, mumps, German measles, and influenza.

Each communicable disease has its own peculiar symptoms and requires specific treatment.

The prevention of the spread of communicable diseases is controlled by medical asepsis, which involves isolation and very important precautions. Handwashing and disinfection contribute significantly to the destruction of disease-producing bacteria and the prevention of the spread of infection.

The doctor is definite in indicating what particular precautions should be taken. Public health authorities control isolation and quarantine. Local health regulations vary in different areas. These regulations should be strictly adhered to.

## Questions

1. What are the four stages in the course of most communicable diseases?
2. What are the two main factors in caring for these diseases?
3. Name some communicable diseases within the scope of the practical nurse's care.
4. Name some communicable diseases which, in the acute stages, are not within her scope?
5. Why is it well for her to know the symptoms of those communicable diseases not within her scope?
6. What is the cause of whooping cough?
7. Describe a characteristic paroxysm in whooping cough
8. How can a baby be relieved if he starts to choke during a paroxysm?
9. What is the cause of chickenpox, or varicella? Discuss its symptoms.
10. What are some symptoms of mumps, or epidemic parotitis?
11. Locate the pain that occurs in mumps.
12. Under what condition can German measles prove very serious?
13. Discuss the symptoms and onset of influenza.
14. What are the three stages of syphilis?
15. What is the best way to prevent venereal diseases?
16. At what time is measles most contagious?
17. Describe the rash which appears in measles.
18. Why is measles especially serious in infants and young children?
19. Describe the onset and progress of diphtheria.
20. What part of the body is infected in meningitis?
21. What is the cause of malaria? What are its symptoms?
22. What are the two common pathways of infection in tuberculosis?
23. What does a positive reaction to the tuberculin test indicate?
24. What are the symptoms of active pulmonary tuberculosis?
25. What is the most important factor in bringing about the arrest of this disease?
26. Discuss temporary or permanent collapse of a lung.
27. Discuss the value of isolation and the need for burning certain articles used by the patient.

28 Recall as many as you can of the specific measures to be taken to prevent the spread of infection in tuberculosis
29 What should be regarded as a hemorrhage in tuberculosis?
30 When is there the greatest danger of spreading a communicable disease?
31 What is meant by (a) concurrent disinfection, (b) terminal disinfection?
32 Describe how to set up a room in the home for isolation
33 What articles must be boiled?
34 Discuss how the nurse's hands should be washed in communicable diseases
35 Describe "gown technic"
36 When *is it* advisable for the nurse to wear a mask?
37 Discuss the care of soiled linen
38 Discuss concurrent disinfection of discharges from the nose and throat
39 How are soiled dishes taken care of?
40 Discuss the disinfection of stools
41 What procedures are performed in terminal disinfection?
42 How will the nurse know what precautions to take in any particular instance?
43 Consult the Glossary for the meaning of the following anti-, bacillus, collapse, fumigation, inflammation, paroxysm, quarantine, recuperate, vesicle

# 55

# NURSING CARE OF THE SURGICAL PATIENT

General care of the surgical patient includes preoperative care, preparing the recovery bed, and the postoperative unit. Simple techniques of surgical dressings that may be adapted for care of the patient in the home have been included in this chapter.

## *PREOPERATIVE CARE OF THE PATIENT*

The purpose of preoperative care is to get the patient ready for surgery in as reassuring and deft a manner as possible, so as to maintain his strength and spirits. The nurse should try to keep other patients from talking about disturbing topics, such as their own surgical experiences. She should avoid discussing the patient's operation with him.

The doctor's preoperative orders provide for emptying the stomach, intestines, and bladder to prevent postoperative nausea, vomiting, gas pains, and possible injury to organs from distention. Shaving and other surgical preparation is done by operating-room personnel or senior nurses, but the nurse who gives preoperative care

should be sure that this preparation has been made All preoperative orders are to be carried out in detail, and recorded immediately

On the day before surgery, the patient should have a complete cleansing bath with shampoo, if necessary A urine specimen is sent to the laboratory The patient is encouraged to take fluids freely, unless there are orders to the contrary, up to the time that they are ordered to be discontinued—usually from 8 to 12 hours preceding surgery An enema is given as ordered The patient has a light supper or special diet as required The doctor usually orders medication to ensure sleep

## PREPARATION FOR SURGERY

On the day of surgery, treatments such as enemas, irrigations, or lavage are given as ordered Breakfast is omitted, and nothing is taken by mouth unless specifically ordered Take and record temperature, pulse, and respiration, and *report any elevation of temperature or any respiratory difficulty*

Morning care Give special attention to mouth cleansing Remove all dentures and put them in water in a tooth mug labeled with the patient's name Comb the hair neatly Remove all combs and pins Remove cosmetics, such as rouge, and nail polish, so that the anesthetist may observe the color of the patient's skin and nails Put a clean gown on the patient, do not tie it

Tie on the wedding ring with a narrow bandage, and remove all other jewelry and eyeglasses Put eyeglasses in a case, and jewelry in an enevelope, label, and send to the cashier s office, if the patient so wishes

Have the patient void, record time and amount Report at once if the patient is unable to void

Put on laparotomy stockings, tie triangle bandage on head if it is the hospital s custom, and cover the patient with a bath blanket Transport patient as ordered

The patient may be taken to the operating room in his own bed, and returned from it in his own bed or on a stretcher

Give preoperative medication as ordered, and record

After patient is taken to surgery make recovery bed unless he

went to the operating room in his own bed, and set up the post-operative unit.

To make a recovery bed

*Equipment*

| | |
|---|---|
| 2 bath blankets | Mouth gag |
| 1 woolen blanket | Mouth wipes |
| 2 sheets | Paper bag |
| 1 drawsheet | Pad and pencil |
| 1 spread | Safety pins |
| 2 pillows | Stethoscope and blood pressure equipment |
| 2 cotton pillowcases | |
| 1 rubber drawsheet | |
| 1 ether rubber approximately 58 in. by 36 in. | |

(Special equipment for the unit, such as shock blocks, intravenous materials, suction and oxygen apparatus, is the responsibility of the head nurse or the team leader. Hospitals differ in procedure.)

*Procedure.* Make under part of bed as usual and place ether rubber at head of bed; tuck in. Put one bath blanket on the bed with the lower edge meeting the lower edge of the mattress and sides tucked in. Turn back the lower corners of the blanket before tucking in so that it can be removed without disturbing the upper bedclothing. Tuck in at the top and miter corners if the blanket is long enough.

Put on the second blanket, but leave the sides hanging loose with the bottom folded up even with the foot of the bed.

Put on upper bedclothing as in an empty bed, but do not tuck in anywhere.

Arrange the sheet and bedspread over the blankets as in opening an unoccupied bed.

Fold the second bath blanket down over the upper bedding.

Turn all bedding up even with mattress at foot of bed. At side of bed, fold linen lengthwise to long edge of mattress.

The bed is left this way in order to make it as easy as possible to place an unconscious patient in the bed.

Pin a paper bag for soiled mouth wipes at the head of the bed with a safety pin. On the bedside table place two emesis basins, mouth gag, mouth wipes, paper, and pencil. Place an extra pillow on the chair by the bedside. Be sure that windows are closed or screened before the patient's arrival, to avoid drafts, and see that

all furniture is out of the way so that the stretcher with the patient can be brought to the bedside

## *POSTOPERATIVE CARE*

**The anesthesia patient.** An anesthetic is a drug which produces local or general loss of sensibility, and depresses the respiratory center Under full anesthesia, patients are quiet, insensible to everything, but breathe easily and regularly As the anesthesia begins to wear off, they sometimes become restless, and may talk incoherently, sometimes they may have to be restrained They may breathe irregularly, often holding the breath until becoming red in the face After vomiting, breathing is easier The period of recovery is longer in some persons than in others A patient should never be left alone until he is entirely conscious and rational and able to reach for the emesis basin himself No attention should be paid to what an anesthetized patient does or says, because he is not responsible and usually does not remember what he has done or said If the patient is left in the recovery room, under the care of a professional nurse until the patient has regained consciousness, the practical nurse will be expected only to proceed with postoperative care on the ward, or in the private unit

**Nursing care on return to unit** When the patient returns from the operating room on a stretcher, assist in lifting him and placing him in a comfortable position in the center of the bed Tuck the bath blanket around him and tuck the upper bedding under the mattress

Keep the patient's head turned to one side, unless otherwise indicated, to prevent aspiration of mucus and vomitus Use suction as directed

Take and record the pulse, respiration, and blood pressure every 15 minutes, or as ordered, until the patient's condition is satisfactory

Watch the patient closely until he is conscious See that sideboards are attached to the bed Patients who have received spinal anesthesia will usually return from surgery fully conscious, but must be watched and cautioned against not raising the head or sitting up for six to eight hours, in order to prevent severe headache

If the patient is receiving intravenous fluids, watch the position

of the needle; see that it does not become dislodged. After the required amount of solution has been given, clamp the tubing, remove the needle, cover the area with sterile gauze, and secure it with two short strips of adhesive. Record the time the treatment ended, the amount and kind of solution administered, and the reaction of the patient.

If the patient is receiving a blood transfusion, watch for signs of reaction, i.e., a drop in blood pressure, restlessness and anxiety, a rapid and weaker pulse, flushing of the face followed by cold sweat and chill. If these signs occur, the solution must be clamped off at once, and the head nurse notified.

Turn, or assist in turning, the patient as ordered. In general, patients are turned often to avoid respiratory difficulties.

Record on the patient's chart: time of return from the operating room; state of consciousness and general appearance; rate and character of pulse and respiration; color and condition of skin; nausea and character of vomitus; condition of dressings; and anything unusual.

Examine the condition of dressings frequently, for staining.

Measure urine for 48 hours (or longer, if ordered). Report the patient's inability to void at the end of from 8 to 12 hours, if he is unable to do so.

Fowler's position. Fowler's position may be used when a heart condition makes breathing difficult, when drainage is expected following chest or abdominal surgery, after thyroid operations, in some cases of pneumonia, or as a preliminary measure to sitting up in a chair.

In this position, the patient is half sitting up, with his back supported either by adjusting the mechanical bed or by a back rest or pillows. His knees are also supported by adjusting the bed or by pillows. A footrest is provided to help the patient maintain the position. Support can be provided in the home by the use of a sort of swing made of a folded sheet, with the ends fastened to the sides of the bed.

Since the position cannot always be recommended, especially if the patient is unconscious, the nurse should place the patient in this position only upon orders from the physician. But if the doctor has ordered the position maintained for the patient, the position should not be changed without the physician's permission.

## *SURGICAL DRESSINGS*

A wound is called an injury to the body of a person caused by violence, or surgery, by which the skin, mucous membrane, or conjunctiva is broken In order to prevent contamination of the wound area by the entrance of bacteria, everything coming in contact with the wound should be sterile This condition is called surgical asepsis In the hospital, sterile articles needed for dressing wounds are generally prepared and distributed by central supply or by operating-room personnel The nurse is given individual instruction in handling sterile goods and equipment in the hospital She washes her hands thoroughly under running water, as taught for medical asepsis, before handling containers of sterile supplies and again before doing sterile procedures

In the home, sterile equipment for dressings and treatments is the nurse's responsibility Gauze squares, cotton balls, applicators, and reinforced dressings of various sizes may be purchased at a pharmacy in small or large quantities in sterile packages Other articles, such as rubber goods, crockery, glassware, and instruments, may be sterilized by boiling in a covered container, such as a large pail or kettle A pressure cooker may be used if available

Boiling time for sterilizing is as follows

*Rubber goods* 10 minutes Place in boiling water and remove immediately after 10 minutes in order to preserve the rubber

*Glassware* 20 minutes Wrap carefully in gauze or cotton cloth and put in cold water to prevent cracking or breakage After boiling, let the water cool before removing the glassware

*Enamelware, crockery, metalware* 20 minutes

*Instruments* 20 minutes

Always be sure that the inside of a sterile package or container is not touched by anything unsterile To open a sterile package, fold back the cover, cut or tear, if paper, without touching the inside of the contents To open a sterile can or jar, remove the cover and place topside down In the hospital, sterile forceps are provided to remove sterile goods from packages or sterilizers In the home, the nurse is careful, when removing basins, bottles, and the like after boiling, to handle only the outside surfaces, keeping her fingers away from the lip of the sterile article

## GENERAL PROCEDURE FOR DOING A SURGICAL DRESSING

The nurse does dressings following surgery only as ordered. The first dressing is always done by the doctor. Dressings applied to absorb drainage or purulent discharges are usually changed by the nurse as often as necessary. In the hospital, dressing trays and carts are kept set up with all needed supplies and sterile goods. In the home, the nurse assembles the equipment and sterilizes what is needed, including any instruments.

To apply a dry sterile dressing. A dry sterile dressing is applied as ordered to protect a wound surface from contact with any material which might harbor disease-producing, or pathogenic, organisms.

*Equipment.* The following equipment is suggested for a dressing in the home:

Alcohol 70 per cent
Sterile gauze squares (these may be purchased)
2 forceps in container in which they are boiled
Paper bag for soiled dressings
Mineral oil for removing adhesive from the skin
Adhesive or Elastoplast
Binder, bandage materials
Safety pins
Bandage scissors

*Procedure.* Take the tray to the bedside. Place the patient in a comfortable position with support for the part to be dressed. Fold the bedding neatly away from the area of the dressing. Wash your hands thoroughly. Open sterile gauze packages. Remove the adhesive by pulling toward the wound to avoid any chance of opening it. With one pair of forceps remove soiled dressing by lifting it at one corner, and discard it in the paper bag. Reserve these forceps for handling unsterile articles. If the dressing sticks to the wound or surrounding area, moisten with boiled water until it comes off freely. Old adhesive marks may be removed with mineral oil.

Using the sterile forceps, remove one sterile gauze square from the package. Replace forceps in container. Grasp the corner of the gauze without touching the center. Cleanse around wound as ordered, moistening the gauze with alcohol, and wiping away from the incision in order to prevent any foreign material from getting into the wound. Use as many gauze squares as needed for cleansing, discarding them into the paper bag. Always use forceps to remove

gauze squares from the package, in order to keep the inside of the package and the remaining squares sterile Be sure that the points of the forceps do not touch anything unsterile

To apply a sterile dressing, place the gauze squares, held with the forceps which should not touch the patient's body or an unsterile surface, over the wound area Use as many gauze squares as needed to cover with several thicknesses To secure dressings and keep them in place, apply strips of adhesive, binder, or bandage material as indicated Always avoid applying adhesive directly over any abrasions in the skin

*Record and report* treatment, time done, appearance of wound, character and amount of any discharge, and the reaction of the patient

Wrap soiled dressings securely and discard in trashcan or incinerator Clean utensils and return to their proper places Clean and boil any instruments used

To apply a wet sterile dressing A wet sterile dressing is applied over a wound or area where the skin is broken, to relieve pain or inflammation, and to promote drainage or suppuration

*Equipment suggested for use in the home*

Tray with equipment for dry sterile dressing with extra supply of sterile gauze squares and solution as ordered at the required temperature in sterile pitcher or bottle
Rubber protector with cover
Rubber pillowcase if arm or leg is to be treated
Waxed paper or other waterproof material to cover wet dressing

*Procedure* Bring equipment to the bedside Place the patient in a comfortable position Arrange the bedding and rubber protector conveniently Wash hands and open sterile gauze package With forceps, remove the soiled dressing and discard in the paper bag Reserve these forceps for handling unsterile articles With *sterile forceps* apply sterile dressing as in the previous procedure, using at least twice as many sterile squares to cover the wound Pour small amounts of solution slowly over the dressing until it is moist Cover with two or three dry sterile squares, then with waxed paper, apply binder or bandage Keep moist for the length of time ordered by pouring on more solution after loosening the upper covering of the dressing

*Record and report:* treatment; time done; kind and temperature of solution; area to which applied; length of time; and local and general effect on the patient.

Wrap soiled dressings securely and discard in trashcan or incinerator. Clean utensils and return to proper place. Clean and boil any instruments used.

To remove adhesive tape. To reduce the irritation caused by the zinc ointment used in the making of adhesive tape, the area may be painted with tincture of benzoin.

The procedure for removing the tape should be explained to the patient beforehand, as the process may be painful. Reduce the pain by holding the skin taut as you gently pull away the tape, first from one end and then the other, working toward the wound. Give the patient time to recover from one painful pull before attempting the next. To cleanse the area, wipe away any remaining traces of the adhesive with a sponge dipped in mineral oil. Then wash with soap and water, dry carefully, and dust with talcum powder. When it is necessary to put on fresh tape, avoid, if possible, the area used in the previous application.

## *BANDAGING*

Principles of bandaging. There are a few general principles that apply to all types and turns of bandages. They are concerned with the safety of the part being bandaged, and the effectiveness of the bandage itself.

All points where two skin surfaces meet inside a bandage, as two fingers when the hand is bandaged, should be separated by some material such as gauze or cotton wadding.

In bandaging an extremity, leave a small portion exposed so that any change in circulation may be observed.

Avoid putting pressure directly on a wound when applying a bandage.

Bandage from the extremity of an arm or leg toward the body in order to avoid congestion, swelling, and possible death of the part below.

Any chest bandage must be applied so that there is no interference with breathing.

For a bandage to be effective, it must be neither too tight nor too loose A tight bandage constricts the part and restricts circulation and healing A bandage which is too loose slips and does not hold the dressing Roller bandages should be anchored by several circular turns, so that they will stay in place Bandages should be flat over the bandaged part so that there is an even gentle pressure All bandages should be fastened securely

Use of bandages Bandages are used to keep splints, surgical dressings, and applications, such as poultices, in place They are also used for support, to limit motion, and to control circulation of the blood in a part where there is hemorrhage or swelling

Different materials used

*Cotton gauze or linen bandages* are most commonly used to keep dressings and splints in place because they are lighter, cooler, and allow for drainage and evaporation They are more easily adjusted than other materials but are not sufficiently firm for pressure or support

*Flannel bandages* are firmer and warmer than gauze or linen bandages and are used more to reduce swelling than for support

*Unbleached cloth bandages* are used to apply pressure, give support, limit motion, and hold splints in place Sheet wadding is often used under the bandage.

*Canton flannel* is used for abdominal and many tailed band ages

*Bandages of loose-meshed material* are also used These are very easy to apply because they stretch to conform to the part and are particularly valuable because they make the pressure uniform

*Elastic bandages* are used to afford support and control hem orrhage

*Crinoline rolled in plaster of Paris* and put on wet is used by physicians to immobilize or prevent motion These bandages become very hard when dry, and are known as *plaster splints*

## ROLLER BANDAGES

Roller bandages are usually made of cotton gauze, tightly rolled They are from 1 to 10 yards in length The width of the bandage is determined by the size of the part or size of application or dressing

*The average widths* of roller bandages are 1 inch for fingers and

toes; 2 and 3 inches for arms, legs, and head; 4 to 6 inches for the trunk.

*The requirements* for a good bandage are that the pressure is even, that it looks neat when finished, and that it stays in place and does not need to be renewed often.

The amount of pressure varies with the reason for which the bandage is applied, but it must be even, as otherwise it will be very uncomfortable and may cause some injury to the part by pressure on nerves and blood vessels. This means that no one turn of the bandage is tighter than the other and that each overlaps the other at the same distance. The bandage must never be tight unless especially ordered.

To apply bandage. Have the patient in a comfortable position. The part to be bandaged must be free on all sides; the arm or leg should be held by another person or supported on the back of a chair, stool, or table. There should be no discomfort to the part.

Stand or sit facing the patient and hold the bandage in your right hand with the roll uppermost. With the other hand, take the free end of the bandage. As you work, you will transfer the roll from one hand to the other; always use one hand to control the bandage. Skill in bandaging can be acquired only by practice. In an operating room and the accident and surgical units, there is naturally a great deal of bandaging which must be skillfully done.

Bandaging is rarely needed in the care of convalescent surgical patients; therefore only the simplest forms will be described in this chapter.

The circular bandage consists of several turns around the part, each turn completely covering the one below. This is the foundation of all bandages, since every form of bandage starts with two circular turns to hold the free end in place.

The spiral bandage is put on with each turn overlapping by half its width the turn below. It can be applied only when the circumference of the body is almost equal, as the upper arm, fingers, or trunk. To apply, first make two circular turns to hold the bandage in place, then lay each turn obliquely, either ascending or descending over the part. Finish with several circular turns and fasten with a safety pin or a small piece of adhesive tape.

Figure-of-eight bandage. Take the lower arm for an example. Make two or three circular turns around the wrist to anchor the

bandage Then carry the bandage across the width of the circular turn diagonally from left to right toward the elbow The descending turn crosses the first ascending turn over the circular turn at the wrist Each turn overlaps the former by one half its width This makes what is known as a figure-of-eight turn and is repeated until the area requiring a bandage is covered Disregard the slack which naturally forms at the upper and under part of the figure eight, this will be secured by the final turns of the bandage Finish with several circular turns and fasten with adhesive tape or safety pins

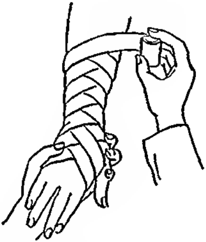

FIG 54 Figure of eight bandage of the forearm (Harmer, Bertha, and Henderson, Virginia *Textbook of the Principles and Practice of Nursing,* 5th ed The Macmillan Company, New York, 1955 )

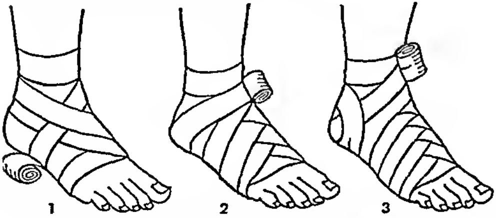


FIG 55 Figure-of-eight bandage of the ankle (Harmer, Bertha, and Henderson, Virginia *Textbook of the Principles and Practice of Nursing,* 4th ed The Macmillan Company, New York, 1939 )

## SOME OTHER BANDAGES AND BINDERS

The handkerchief bandage, as its name implies, consists of a square of soft material folded into the shape of a triangle or lengthwise like a necktie. It can easily be fitted to the foot, hand, head, knee, or elbow and tied or pinned in place. This bandage is chiefly used for emergencies.

FIG. 56. Handkerchief bandages applied to foot and knee. (Harmer, Bertha, and Henderson, Virginia: *Textbook of the Principles and Practice of Nursing*, 4th ed. The Macmillan Company, New York, 1939.)

The tailed bandage is made of a piece of cotton cloth longer than it is wide, with the ends split into one or more tails, leaving sufficient space in the middle to cover the affected area, and may be used in a variety of ways. It is useful for holding in place applications which must be frequently renewed, such as poultices and wet dressings. The tailed bandages most commonly used are the one-tailed or T binders, the two-tailed or double T binders, the four- or six-tailed and the many-tailed binder also known as the scultetus bandage.

T binders, single and double. The T binders are used to keep dressings in place over the external genitals or rectum. They are made of strips of unbleached muslin or Canton flannel fastened

together in the shape of the letter T The strips are usually 4 inches wide and 1 to 1½ yards long For a female patient they are made with one tail, and for a male patient, with two tails

*To apply*, slip the straight strip around the patient's waist, bring the tail or tails up between the legs, and pin in the center of the waistline

The four- or six-tailed bandage is used to hold dressings in place on the head, chin, or knee and to keep wet dressings or poultices in place on the arm, leg, chest, or abdomen when the patient is lying in bed The tails can be split into four, six, or more and in applying are lapped over each other and secured under the final tails, which are tied or pinned, or the two opposite straps can be tied together all the way up or down with the ends of the preceding knot neatly slipped under the next The former method is better when the dressings are applied frequently, as there is not so much to undo and it is less disturbing to the patient

The scultetus bandage, or many-tailed binder, is used to keep abdominal dressings in place and to support the abdominal muscles It is also used on the chest It is made of five strips of Canton flannel, 3 to 5 inches in width and about 48 inches long The strips are laid so that they overlap for half their width and in the center are sewed together for about 9 inches to make a firm body The edges should be hemmed or overcast

*To apply*, slip the binder under the patient, being careful to place the binder in proper position, without wrinkles in the body of the binder The first strip must be free its whole width If placed incorrectly, the first strip will overlap the second, which will interfere with the proper application of the binder The binder must come low enough to cover the hips If it interferes with the use of the bedpan, however, it may have to be reapplied

Begin at the bottom and bring the two opposite strips together Lay first strip obliquely over the abdomen and fasten firmly with several safety pins Continue, alternating from each side and laying strips smoothly in place *The reason for alternating is to give pressure* The strips are not pinned until the last strip is reached except in certain cases when it may be necessary to put in a few pins. The last strip encircles the waist and is pinned firmly Care must be taken not to have wrinkles in the back or over bony prominences because of the danger of bedsores

When pressure is desired in the upper part of the abdomen, the binder is slipped under the patient with the free strip at the top, and the upper strips are fastened first. A certain amount of pull must be made in applying the bandage but not enough to cause discomfort to the patient. Two people working together can apply this bandage better than one. After the scultetus bandage is entirely fastened, perineal straps may be applied to prevent the bandage from slipping up. When properly applied, this bandage gives great comfort and support. It defeats its purpose when allowed to become loose.

A straight binder is used to hold dressings in place on the chest, abdomen, and breast. It is made of Canton flannel or a double thickness of strong cotton cloth and is usually 12 to 14 inches wide and 40 inches long.

*To apply,* pleat or roll one-half of the binder and slip under patient. Pull pleated end over, having an equal amount on each side. Fold one end of binder under a few inches and lap over opposite side. Beginning at the bottom, pin in place with large safety pins. The pins should be about two inches apart. Be careful to keep the overlapping end of the binder in a straight line with the corresponding end. Any fullness is taken care of by making a pleat at each side, following the body curves, and by fastening the pleat with small safety pins. An equal amount must be taken in on each side so that the pressure is even.

The method of applying a straight binder in obstetrical cases is described in Chapter 42 "Postnatal Care."

Perineal straps are for the purpose of holding the binder in place. They are made of strips of the material, 2 inches wide and 27 inches long. On the abdominal binder, the straps are pinned on the lower edge of the binder in back, drawn up between the legs, and pinned to the lower edge of the binder in front. Place the pins so that the patient will not lie on them.

Shoulder straps. To keep a chest binder in place, a strap can be made from either bandage or cotton cloth. It should be about 1½ inches wide and a yard long. The strap is pinned in the shape of a V on the upper edge of the binder between the shoulder blades, an end being brought over each shoulder and pinned on the upper edge of the binder over each breast.

A sling is a swinging bandage used to support the forearm,

hand, and elbow It is made of a square of material folded in two, diagonally, to make a triangle

*To apply* Flex injured area Place triangle under arm with apex of triangle under elbow as in Figure 57 Bring bottom point up over shoulder of injured arm Tie two points of triangle in square knot Be sure the knot is on one side or the other to prevent pressure on spine The apex of triangle can then be neatly pinned to give additional support

FIG 57 Sling made with triangular bandage Sling is usually applied over the clothing (Harmer Bertha and Henderson Virginia *Textbook of the Principles and Practice of Nursing* 5th ed The Macmillan Company, New York 1955 )

## *EARLY AMBULATION*

Early ambulation means getting the surgical patient out of bed and actually walking around within 24 to 48 hours after his operation

After an operation the body is upset Although the organic condition has been corrected, functional and nervous illness is likely to set in unless something is done at once to counteract it

The autonomic nervous system reacts to the operation by stimulating the glands and involuntary muscles The vital processes become disturbed and depressed Three systems, in particular, are

affected: the respiratory, the circulatory, and the digestive. Breathing becomes difficult and mucus tends to plug the bronchial tubes. The postoperative patient has very poor circulation when inactive, because of congestion of the blood vessels. The stomach often becomes distended with gas.

Walking soon after the operation produces beneficial effects on breathing, circulation, and digestion. Pain from wounds is diminished. Walking brings into use most of the muscle groups, and a general return to normal is started without delay.

Both the patient and his family may be afraid that he lacks strength to walk shortly after the operation. To offset their apprehension the nurse should give them a convincing explanation of the good which early ambulation will accomplish and they should be assured that the physician will consider all factors before he gives his orders. They should be told that walking will not reopen the wound, but will assist in the healing process.

If the patient should continue to resist ambulation it would indeed be difficult for the nurse to insist that his program for quick recovery be carried out. He must be brought to the point where he no longer feels insecure. He should look forward with confidence to regaining his ability to return sooner than he expected to his work-a-day life.

"Total nursing care"—the care and consideration given to the patient as a person, combining intelligent observation with an optimistic attitude—is needed now more than ever, for understanding the patient is essential to building his morale.

Carefully prescribed exercises in bed and while standing, to strengthen muscle tone and to stimulate normal functioning, may precede or accompany early walking, but they are no substitute for it.

Although the patient who can walk can take care of most of his personal hygiene, thus reducing the number of toilet procedures which the nurse has to give him, she must remain as watchful as ever—perhaps even more so. Owing to the possibility of the patient's collapsing because of a sudden pulmonary infarction (see Chap. 44, "Some Diseases of the Circulatory System"), or to the possibility of emboli forming, he should be carefully supervised while he is in the bathroom, the door of which should never be locked.

Since the patient's stay in the hospital has been very muc

shortened, the practical nurse will have many more names of patients to remember—for more patients can now be admitted She will have to use more care to identify each patient positively before she gives him medicine If he is not in bed, she may have difficulty in locating him when the doctor makes his rounds

In some hospitals, the bed may be too high for the patient to get out of it without using a footstool Some beds can be lowered by the patient *pushing* a button *Footstools are likely to slip* The charts are usually kept at the nurse's station, for patients are not allowed to read either their own chart or those of others Drainage tubes and bottles are hard to manage, but procedures are modified to meet new situations Easy chairs replace straight ones Handrails are put up along corridors Floors are sometimes mopped earlier in the day so that they will be dry by the time the patients are up and about, as slippery floors are especially dangerous Recreation rooms, lounges, and sun porches are opened up early so that patients starting out on their travels will have an attractive place to go and the companionship of others whose difficulties and efforts parallel their own

The practical nurse should do her best to cooperate with other personnel to see that patients do not go into service or utility rooms, that they do not have access to the medicine closet, and that they do not loiter near the desk of the head nurse or the nurse's station *In most hospitals they are restricted to areas designed for their* comfort, where they will not interfere with the efficiency of hospital workers

**Points in getting out of bed which apply especially to early ambulation**

1 The patient will wear his own shoes rather than slippers They should be kept at his bedside, along with his bathrobe and a footstool

2 Before the patient attempts to sit up, turn him with his knees flexed onto the side which has been wounded

3 To avoid injury to the patient's legs in getting out of a high bed, be sure he uses a footstool Hold the stool firm so that it will not slip

4. As the patient stands on the footstool for a few moments, have him cough so that he may raise any mucus in the bronchi Place your hands over his lower ribs to help him keep his abdominal wall from moving as he coughs

5. See that catheters, drainage tubes, and bottles are clamped off, in accordance with the doctor's orders.

6. Watch the patient continuously to see if he is becoming faint. If he is, let him sit down or lie back in the bed until he recovers.

7. Before the patient takes any steps, be sure that his color is good and his pulse normal.

8. Do not expect too much the first day; but, by giving the patient the proper support, win his confidence so that each time he gets out of bed he may look forward to promoting his recovery.

## *SUMMARY*

General care of the surgical patient includes preoperative care, and preparing the recovery bed and the postoperative unit. The simple techniques of surgical dressings given may be adapted to the home.

The patient has to be prepared for surgery, yet kept undisturbed and relaxed as much as possible. Some procedures will be performed by operating room personnel, but to see that the preparation is made is the responsibility of the nurse who gives preoperative care. The preparation begins on the day before surgery and is continued in the early hours of the day of the operation.

After the patient has left the unit, the recovery bed is made and the postoperative unit is set up.

When the patient returns from the operating room he is assisted to bed and placed in a safe and comfortable position. He may be given intravenous fluids or a blood transfusion. Since serious symptoms may develop, he is watched very closely, besides being given frequent attention. He may be placed in Fowler's position on doctor's orders.

In the hospital the nurse is given individual instruction in handling sterile goods and equipment; in the home she must be conscientious about handwashing, sterilization, and the handling of sterile goods and equipment.

Sterile dressings—wet or dry—are applied under aseptic conditions and are wrapped and burned after use.

Bandaging is used to keep splints and dressings in place. It will not be comfortable if either too tight or too loose. Bandages are of

several types, adapted to particular situations To bandage skillfully requires much practice

Within a day or two after an operation, the doctor considers the possibility of helping the patient to recover more quickly by getting him to walk Since usually neither the patient nor his family are confident in the patient's ability to do this, the nurse adopts the attitude of the doctor in lending encouragement and help

At the same time she is very watchful to note the patient's condition and reactions, so that although he may not make much progress on any one day, his morale will remain high, and he will constantly go ahead

## Questions

1 What is the purpose of preoperative care?
2 What do the doctor's preoperative orders include? What procedures are performed the day preceding the operation?
3 List possible treatments, data to be recorded, and facts to be reported on the day of surgery
4 After the patient is taken to surgery what is done in the unit by the nurse?
5 How should the patient's head be turned when he returns from surgery?
6 If a patient is receiving a blood transfusion, what symptoms should the nurse watch for?
7 Why should the patient be turned often?
8 After how many hours should the patient's inability to void be reported?
9 Define the term "wound"
10 What is surgical asepsis?
11 Describe "handscrub" in detail
12 How long should each of the following be boiled for sterilization in the home (a) rubber goods, (b) glassware, (c) instruments?
13 Describe how to open (a) a sterile package, (b) a sterile can or jar
14 For what reasons are surgical dressings applied?
15 In what direction should adhesive be pulled to avoid reopening a wound?
16 How may old adhesive marks be removed?
17 Why does a nurse wipe away from a wound when cleansing the surrounding area?

18. Under what conditions is a wet sterile dressing applied?
19. What data are recorded after applying a wet sterile dressing?
20. In what situations is Fowler's position sometimes used?
21. Describe this position.
22. What are bandages used for?
23. Tell briefly the particular use for bandages made of cotton gauze or linen, flannel, unbleached cotton, loose-meshed material, elastic, and crinoline rolled in plaster.
24. Discuss how to apply a bandage.
25. Name some of the bandages described in this chapter.
26. Be ready to identify each type as you see it demonstrated.
27. What is meant by "early ambulation"?
28. What effect does an operation have on the surgical patient?
29. What benefits should the patient derive from early ambulation?
30. What can be done while the patient is still in bed to strengthen muscle tone? To what extent is this a substitute for walking?
31. Why should the patient be supervised while he is in the bathroom?
32. What new difficulties may the nurse encounter in identifying her ambulatory patients to give them medication?
33. Name some other changes in hospital conditions caused by the increased use of early ambulation?
34. Discuss the advisability of restricting ambulatory patients.
35. What observations should the nurse make while the patient is getting out of bed, and standing, preparatory to walking?
36. What should she do if the patient appears faint?

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# SOME DISEASES OF THE NERVOUS SYSTEM

## *IMPORTANT SYMPTOMS OF NERVOUS DISEASE* *

Delirium is a state of mental excitement and agitated confusion in which the patient is not in complete contact with his environment. Delirium occurs in illnesses which affect the nervous system, especially in those due to infections, and intoxications. One kind of delirium is *delirium tremens*, which is seen in acute alcoholism. Patients with delirium are often frightened, and have hallucinations that are frequently horrifying. They cannot interpret their environment correctly, and may harm themselves or their nurses. The patient with delirium should be nursed as if he were a frightened child. Constant reassurance, rest and quiet, and sedatives given under medical supervision usually accomplish far more than vigorous restraints.

Coma is a state in which awareness is lost and the patient does not respond to external stimulation. This may be the consequence of many things, principal among which are drug intoxications, strokes, infections of the brain, diabetes, and uremia. The patient

* See also Chap. 15, 'The Nervous System.'

in coma requires the most diligent nursing care. Since he lies motionless, he must be turned often, bathed regularly, and kept free of skin irritation to prevent bedsores. Since he cannot eat in the usual way, he must be fed by stomach tube or by vein. His bowels and bladder may not function properly, and it is often necessary to catheterize the bladder or give an enema. He is often unable to cough, and the mucus in his throat and bronchi must be removed by suction. Good nursing care is the most important part of the treatment of a patient in coma.

Convulsions are sudden, violent contractions of muscles, which result from various kinds of disease of the brain. They may be generalized, and when they are, the patient always loses consciousness. When they are restricted to one part of the body, they are called *local convulsions*. When they start in one part of the body and spread, they are called *Jacksonian*.

Epilepsy is a condition in which patients have recurrent convulsions, mild and severe, over many months or years. (In other instances, however, the convulsions are due to tumors, abscesses, scars from injuries, or to tetany.) The nurse who is present when the patient has a convulsion can be of enormous help to the doctor by making very careful notes of the sequence of events, since by knowing how a convulsion began and what course it followed, the doctor can often make a diagnosis. The patient should be protected from hurting himself in the course of his thrashing around. The occasions are rare in which it is necessary to insert an object between the teeth. Patients frequently bite their tongues, but they do it in the first few seconds of the convulsion before anything can be done to prevent it. Fortunately, there are medicines which are helpful in reducing the frequency of convulsions. These medicines, like all others, have undesirable effects in some patients, and whenever the nurse sees an epileptic patient getting drowsy or staggering she should call it to the attention of the physician.

Hemiplegia is a paralysis of one side of the body, which most commonly results from vascular disease of the brain, although there are many other causes. It is the commonest neurological disorder which requires prolonged nursing attention. The weakened limbs are most often *spastic* (characterized by spasm). A muscle is called spastic when it is made to contract by stretching it. Spastic limbs

frequently become deformed and painful unless the nurse helps the patient to stretch them gently at least daily The hemiplegic patient sometimes can do much for himself and should be encouraged to do as much as possible, more often, he has to be helped in everything

Paraplegia is a paralysis of both legs, usually resulting from injury to the lower spinal cord, but seen also in such conditions as multiple sclerosis and poliomyelitis

Quadriplegia is the term employed when both the arms and legs are involved Except in the early stages of poliomyelitis, the bladder and bowels are not affected, and sensation is normal In spinal injuries and in multiple sclerosis, however, there usually is reduction or loss of sensation and loss of control of bladder and bowel function This, of course, makes the nursing problem much more complicated Bedsores occur easily in paraplegia and quadriplegia, and only the most scrupulous care of the skin can prevent them

Aphasia is an inability to produce speech or to make one's speech understood by others, because of a brain lesion It is a frequent complication of right sided hemiplegias in right handed persons and of left sided hemiplegias in left handed persons In all instances the patient can understand what is said to him, and can carry out commands, but he is unable to make himself understood It is important to realize that these patients are usually capable of normal thoughts and normal feelings They become very frustrated by their difficulty in communication The good nurse, aware of this, is sympathetic and helpful Often the nurse is able to work out methods to make the patient understand and to help him make himself understood by routes other than speech

## *SOME DISEASES OF THE NERVOUS SYSTEM*

Acute anterior poliomyelitis is also called ' infantile paralysis ' though other names are given to the disease, which affects chiefly infants and children In recent years, however, adults are affected almost as frequently as children It is an infectious disease which starts out with fever, headache, stiff neck, and stiff back Fortu

nately, in the majority of instances it is "nonparalytic." In others, however, the virus which causes the disease lodges in the motor cells of the spinal cord. Then paralysis takes place quite rapidly, and with rapid paralysis there is a varying degree of pain in the muscles for a few days or weeks. In comparatively few cases, the paralysis remains complete and permanent, but most patients recover enough function to get along in life.

Pain in the early stages can be controlled with hot packs and suitable medication. Some patients develop paralysis of their muscles of respiration, and a mechanical device of one sort or another has to be used to help them breathe. The best known of these is the iron lung. The care of the patient in the iron lung is almost a nursing specialty in itself.

When the patient is beyond the point of danger, intensive physiotherapy is begun and continued until the patient is making the most and best use of the muscle power which has been left him.

Cerebral palsy is a condition present at birth which interferes with normal muscle action because of a brain lesion (referred to by the medical profession as *spastic diplegia*). Included in this group are a multitude of disease states that result in congenital deformities, disorders sometimes associated with convulsions and mental deficiency, etc. For practical purposes, these children generally are divided into those of normal intelligence and those who are mentally defective. The former can be trained physically and psychologically to live happy and useful lives. If the mental deficiency is severe, the latter are better off in an institution, removed from the trials of competitive society.

In some cases the "palsy" is a form of spasticity or stiffness of the muscles. In other cases, involuntary movements, called *athetosis*, or *chorea*, or *dystonia*, produce the equivalent of palsy by interfering with coordination.

The training of such children requires the most profound patience and courage on the part of the children, their families, their nurses, or the therapists.

Progressive muscular dystrophy is a rare form of disease beginning in childhood or adolescence that is characterized by wasting of the muscles, of unknown cause, which tends to run in families. The weakness begins in the shoulder muscles, and then very gradu-

ally spreads to involve the other muscles of the body, lastly the face, forearms, hands, and legs Generally, the younger the patient when the disease begins, the more rapidly it spreads, and the more complete is the disability When very young children are affected, they are usually confined to a bed or a wheel chair by the age of 12 or 13 When older persons are affected, they may never get more than a moderate degree of weakness in the shoulders and in the hips Bladder function and bowel function remain normal even when complete muscle paralysis is present

Multiple sclerosis is a disease of young adults (15 to 35 years) which generally runs a remitting and relapsing course, producing visual disturbances, sensory disturbances, paralyses, incoordination, and loss of bladder control In more severe cases, it may produce complete blindness, paraplegia, or even quadriplegia The disease has wide variations Some patients may progress rapidly to complete and permanent disability or death within a few months, others may have only a few fleeting symptoms for a few days each year Every hospital for the chronically ill has many patients with multiple sclerosis This is usually the group which has developed paraplegia with bladder troubles Only the most scrupulous nursing care can prevent kidney infections and bedsores The intelligence of the patient remains unaffected

Parkinson's disease is a disorder which was known for many years as the "shaking palsy" The disease is of unknown cause, and begins in late middle life or in old age

A slowness of movement and a fixity of facial expression is usually the first sign of the disease After a few months or years, the characteristic tremor is noticeable There is a rhythmic shaking of the fingers and the hands, which spreads in severe cases to involve the arms, legs, head, and trunk A peculiar kind of stiffness of the limbs, called "cog-wheel rigidity," is almost always present Intelligence usually remains normal

The course of the disease and the disability caused by it is variable Some patients continue to work and enjoy life despite a rather severe shaking Others must be admitted to hospitals for chronic diseases

In handling such patients it is important to encourage them to keep active Many of them tend to give up the fight against the

disability, and only firm and kindly persuasion by sympathetic families, nurses, and doctors can keep them from slipping into a premature helplessness.

## CEREBRAL ACCIDENTS

Cerebral hemorrhage, thrombosis, and embolus are frequently experienced in elderly individuals. These conditions make up a large share of those individuals requiring nursing care in the home. Any of these three conditions is commonly called *stroke,* or *apoplexy.* A *cerebral hemorrhage* is caused by a rupture of a blood vessel in the brain and results in such severe brain damage that the outcome is fatal in approximately 95 per cent of cases.

A *cerebral thrombosis* consists of a plugging of one of the main arteries to the brain, caused by hardening of the arteries and superimposed clotting, resulting in damage to the brain cells supplied by any one or more arteries because there is a lack of sufficient blood supply to these cells.

A *cerebral embolus* is caused by a clot lodging in one of the arteries of the brain with resultant damage to the area of the brain supplied by that artery. The clot usually originates from the heart, secondarily to disease of the heart itself, and after the clot breaks off, travels by way of the blood stream. Hardening of the arteries of any part of the body may give rise to an embolus. Since these conditions affect largely either one side of the brain or the other, there will be a paralysis of the arm, leg, and face of the opposite side. A paralysis of this type is called a *hemiplegia.*

*Symptoms.* The symptoms of a cerebral vascular accident (hemorrhage, thrombosis, or embolus) vary with the severity of the damage and the location. Usually the onset is abrupt and associated with a generalized convulsion and loss of consciousness. Following this, there is apt to be stertorous breathing with turning of the head toward the side of the brain damage and loss of movement (hemiplegia) of the arm and leg which has become paralyzed. The patient may remain unconscious for several hours or several days, although improvement, if there is going to be any, will usually appear by the third or the fourth day. Ominous signs which precede death consist of deepening coma, increased amount of sweating, rising temperature and pulse rate, and intermittent gasping respirations.

## *NURSING CARE OF THE HEMIPLEGIC PATIENT*

There are few conditions that require more skill and ingenuity on the part of the nurse than the care of the hemiplegic patient The unconscious patient presents a particularly challenging problem During the initial stages, if the patient is in deep coma, he will not be able to swallow, raise mucus, control his bowels, or protect himself in any way Feeding should not be tried until it is clear that the patient can swallow At this time feeding should be given in cautiously small amounts It is preferable that the patient does not lie on his back, since mucus from the mouth will collect in the back of the throat and be sucked into the trachea and lungs during the process of breathing Also, the airway may be obstructed as a result of the jaw and tongue falling backward against the back of the throat, which can always be detected by the presence of snoring The problem can best be solved by having the patient lie either on his side or practically on his abdomen Care of the mouth should be given frequently, in accordance with the methods described elsewhere (Chap 27, "General Care of the Patient") Usually the patients are incontinent of feces and urine, therefore constant attention with pads is necessary to keep them dry so that they will not develop bedsores They should be turned from side to side every hour to help keep mucus from collecting in the lungs, which would result in pneumonia or collapse of areas of the lung

Many individuals are fortunate enough to recover completely, while others recover only partially but can be helped to return to a useful and active life by patient and careful management Encouragement *is* very important, and *all* signs of improvement must be emphasized for the patient's benefit Those who have a paralysis affecting the right side of the body, if they are normally right-handed, may lose the power of speech Special re-education is usually necessary if this is so On the side of the paralysis, the tendons in the arms and legs tend to contract so much that the fingers, wrists, elbows, shoulders, knees, and ankles are in a flexed position Gentle exercises several times a day, promoting straightening of these joints, will help to prevent flexion When the patient is in bed, it is important that the bedclothes over the feet not be tight, since this tends to cause foot drop If the board or pillow is placed at the lower

end of the mattress perpendicularly and resting against the footboard of the bed, the bedclothes may be placed over it, thereby taking the pressure off the feet. A pillow should be kept in the axilla on the affected side to prevent adduction contracture of the arm to the side. Pillows or even sandbags should be placed laterally along the paralyzed leg to prevent outward rotation of the leg. Squeezing a soft rubber ball or sponge-rubber pads in the affected hand is a good exercise to restore muscle power.

It is generally felt that the patient should be got out of bed and placed in a chair as soon as reasonably possible, as it affords a means of encouragement and decreases the complications, such as pneumonia and bedsores. Judiciously placed pillows as well as frequent changes of position are necessary.

As a help to first sitting upright in bed, a small rope, either of window cord or braided bandage, can be tied to the end posts of the bed and brought up two-thirds of the patient's length in bed. This rope should be arranged so that he may grasp it easily with his good hand. He should be taught to use both arms to pull himself to a sitting position by holding the paralyzed hand in position on the rope with the good hand.

The first attempts at helping the patient to walk will usually require the assistance of one or two others, and should be taken slowly and cautiously.

Standing by the side of the bed is the first step in this procedure for the patient who can be assisted by the use of two chairs placed so that he can lean on the backs of the chairs with one hand on each. (The paralyzed hand may need to be placed in position, and should be, even though there seems to be no use in doing so.) When the patient is able to hold himself up, he may proceed to attempt walking with the aid of others for his support. A distinct help at this stage is to have the patient use an ordinary straight chair as a walker. This may be done by having him stand behind the chair, rest both hands on the top round, and push the chair across the floor. The chair will provide the support and confidence which he needs.

The hemiplegic patient should be taught to take care of his personal needs and cleanliness; to dress whenever possible; and to carry on as much as possible by himself without help. Of course, only those who do not have widespread brain damage, senility, or other serious diseases can be successfully rehabilitated. The degree of

motivation which the patient possesses is frequently the key to success, but the minor items described above are very important steps in achieving the successful outcome

## *SUMMARY*

This chapter covers (1) some symptoms of nervous disease, (2) some diseases of the nervous system, (3) cerebral accidents, and (4) mental illness

The symptoms described are delirium, coma, convulsions (particularly in epilepsy), paralysis as in hemiplegia, paraplegia and quadriplegia, and aphasia

The diseases of the nervous system include acute anterior poliomyelitis, cerebral palsy, progressive muscular dystrophy, and multiple sclerosis

Cerebral accidents include cerebral hemorrhage cerebral thrombosis, and cerebral embolus

In all nervous disorders, hygienic procedures should be carried out with care But fully as important is the constructive attitude of those who minister to patients in these groups for their total care requires sympathy, courage, patience, and ingenuity

Questions

1 Describe (a) delirium (b) coma, (c) convulsions
2 What is the difference between local and Jacksonian convulsions?
3 What are some of the causes of convulsions in epilepsy?
4 What can be done to keep an epileptic from hurting himself?
5 What two symptoms of epilepsy warrant the nurse calling the doctor at once?
6 What is hemiplegia? When is a muscle called *spastic*?
7 What is the difference between hemiplegia and paraplegia in so far as the extent of paralysis goes?
8 What condition of the paralytic patient makes nursing more than ordinarily difficult?
9 Discuss the ability of the patient suffering from aphasia to understand others and to make himself understood
10 What is the usual mental condition of the aphasic patient?

11. What are some of the early symptoms of poliomyelitis?
12. What is the cause of poliomyelitis?
13. What is an iron lung?
14. Discuss the two main classes of children affected with cereb palsy. What can best be done for each of these groups?
15. Discuss progressive muscular dystrophy.
16. What disturbances occur in multiple sclerosis?
17. By what name was Parkinson's disease formerly known? What the first signs of the disease?
18. Should patients with Parkinson's disease be encouraged to active?
19. At what age are cerebral accidents generally experienced?
20. What are the prevailing conditions in cerebral accidents?
21. Name some ominous signs which precede death as a result c cerebral accident.
22. Why should the hemiplegic patient lie on his side while he i a coma?
23. Review some of the main considerations in nursing care of hemiplegic patient.
24. Describe how chairs can be used to advantage when a hemipl patient is learning to stand.
25. What hemiplegic patients have a chance of being rehabilitat

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# SOME INJURIES TO AND DISEASES OF THE MUSCULOSKELETAL SYSTEM

## *DISEASES OF MUSCLES*

### PARALYSIS

When a nerve to the muscle is either damaged or becomes infected, as in poliomyelitis, the muscle becomes paralyzed, since the movement of muscles is controlled by the nervous system Other kinds of damage to the nervous system may produce the same result

Atrophy, or wasting, of muscles The unused muscles gradually become atrophied, that is, they shrink in size and waste away In many long term illnesses, particularly typhoid fever, the muscles become weak from disuse and lack of adequate nourishment When this occurs, convalescence is very much prolonged, consequently the patient has difficulty in moving his muscles for several weeks or even months after the disease itself has been cured When a patient is confined to bed for a long time, the doctor may order certain exercises as part of the physical therapy program

EXERCISES The exercises prescribed by the doctor are for the purpose of correcting, remedying, and preventing muscle weakness and deformity The exercises maintain general muscle tone,

strengthen muscles which are impaired or injured, and re-educate immobile muscles to perform their function. All these exercises require special knowledge and skill, and require training by those who have specialized in physical therapy. For these reasons no exercises should be given the patient except on the advice of the physician and under the direction of the physical therapist. If the practical nurse is properly instructed and supervised, she may see that the patient follows the program of exercises mapped out for him. In this way she can help to shorten his period of convalescence and take part in preparing him for crutch walking and early ambulation. (See Chap. 58, "Nursing Care of the Orthopedic Patient.")

Infections. Bacteria and parasites in rare instances, as in trichinosis (caused by a parasite), may invade muscle tissue to cause disease in the muscle (*myositis*).

Injuries to muscle. Prolonged or unusual exercise causes muscle stiffness. Generally the pain and stiffness are not serious or of long duration. Sometimes after cold or exposure following unusual exertion, attacks of intense pain may occur in certain muscle groups. Stiff neck and lumbago are two common forms of this condition. Rest, local heat, and sometimes massage will usually relieve this condition.

If the muscle is stretched to an extreme, the muscle fibers are ruptured with subsequent hemorrhage, and if the strain is severe enough the tendon also may be ruptured.

Tumors. These are often malignant and in that case require radical surgery. (See Chap. 51, "Malignant Tumors.")

## *INJURY TO BONES*

A bone may be broken (fractured) completely, or in such a way that only one side is broken as in a greenstick fracture. A greenstick fracture is an incomplete break of a long bone, seen in children, where the bone is splintered only on one side. When the ends of the bone or bones penetrate through the skin, the condition is called a compound fracture which is subject to infection because the parts are exposed to the air. Bone tumors or cysts may be the site of a pathological fracture. When a bone end is pushed out of the joint

capsule, it is dislocated, and may be associated with a fracture When a bone is broken, there is an immediate bleeding from the surrounding tissue and marrow, which forms what is called a *fracture hematoma* When healing begins, new cells grow out from the periosteum (the covering tissue of the bone) These new cells provide the structure for mineral deposits to form the bony callus which surrounds a fracture site After healing is completed the callus is absorbed, and the bone generally assumes its original shape

*Treatment* is designed to aid in the process of mending and regrowing bone structure The physician sets the bone ends together whereby he forms a straight line Healing takes place at the joined ends and sides of the fracture A plaster cast is usually applied to hold both bone ends together (See Chap 58, "Nursing Care of the Orthopedic Patient")

The joints near the fracture may also be injured, either completely dislocated or partially sprained, with torn ligaments and damaged cartilage When this occurs there is bleeding into the joint, which tends to prevent further motion of the tense painful joint The surgeon will treat the condition in such a way that the swelling and pain will subside, and the patient can begin exercises

## CONGENITAL AND DEVELOPMENTAL ABNORMALITIES

These include a large group of diseases where the bones and joints are improperly formed, such as club feet and congenitally (present at birth) dislocated hips As the child grows in the mother's uterus, development may be abnormal, as with spinal curvature, knock knees, and flat feet Abnormal development may also be caused by dietary deficiency, as in rickets (a vitamin-D deficiency) Surgery and orthopedic appliances do much to relieve these conditions

**Infections of bones and joints.** Infections are encountered in decreasing numbers through the use of penicillin and other anti biotics Infected bone—osteomyelitis—may arise following injury when the bacteria get directly into the bone, as in compound fractures, or are introduced by the blood stream, as in tuberculosis Septic arthritis, or joint infection, may also originate by blood-borne or directly introduced bacteria Surgical drainage of the pus,

with removal of associated tissue, combined with splinting of the infected limb or joint, is aided by new antibiotic drugs in successfully treating these heretofore crippling infections.

Tumors. Growths of the bones and joints, such as benign (nonmalignant) tumors or cysts (sacs with distinct walls containing fluid or other material), require surgery. Bones are frequently the site of metastatic tumors from prostatic, breast, and lung cancers.

## *DEGENERATIVE DISEASES*

When a person is less active, his bones lose calcium, a process called *osteoporosis* or softening, such as occurs in the inactivity of old age, or when a patient stays in bed for long periods. Soft bones fracture easily.

Repeated joint motion over the years tends to wear out and injure cartilage. Joint degeneration produces painful arthritis, either as a result of prolonged irritation and wear—as in degenerative arthritis—or as a result of joint reaction to the generalized body disorder of rheumatoid arthritis.

### ARTHRITIS

*Arthritis* is a general term which is applied to various types of joint inflammation. The most common and disabling type is rheumatoid arthritis. Other diseases associated with joint inflammation are rheumatic fever, gout, and a large variety of bacterial infections. Since the introduction of effective antibacterial agents, the frequency and severity of true infectious arthritis has greatly decreased.

Rheumatoid arthritis. Joint involvement is the outstanding feature of rheumatoid arthritis. The disease may produce inflammation in many other tissues, however. Most prominent among these are muscles, peripheral nerves, skin, eyes, and, much more rarely, the heart. When the heart is involved, confusion with rheumatic fever is easily possible in some cases.

The cause of rheumatoid arthritis is not known. Individuals with the disease, however, often can associate the onset of initial or subsequent attacks with various types of stress and strain such as

fatigue, emotional shocks or conflicts, severe exposure, operations, childbirth, infections, and injuries

The course of rheumatoid arthritis is variable with regard to the number of joints involved, the severity, and the duration Some patients suffer one attack and then enjoy complete relief for years, or, indeed, the rest of their lives In contrast to these comparatively fortunate individuals are those with a severe progressive involvement Early in the course of illness the joints are subject to inflammatory change and are swollen, painful, tender, and stiff The degree of inflammation tends to limit the joint motion at this stage With continued joint involvement for a period of months, there is great danger of damage to joint cartilage and soft tissue, as well as to the muscles which should move the joints, and gradually motion may be lost If joint motion is not maintained while the disease is active, there is danger of further progression over the months and years, with complete loss of motion due to bony union across the joint spaces When this occurs it is termed *ankylosis*

Rheumatoid arthritis of the joints of the arms and legs is more common in women than in men The variety which is confined to the spine and sacroiliac joints, in contrast, is more frequently encountered in men When severe, it may result in complete rigidity of the neck and back

Nursing care in rheumatoid arthritis is necessary sometimes during acute early stages of the disease More commonly, however, it is required in severely crippled chronic cases In the majority of patients, nursing care is not necessary, since they can be taught the essentials of treatment and are able to carry them out without help from others

The treatment of rheumatoid arthritis is directed toward both the improvement of the general condition of the patient and also the maintenance of normal joint and muscle function

*Rest* Bed rest for weeks or months is often an important part of treatment It should be emphasized that exercises for joints and muscles are performed regularly Many patients who do not understand this are fearful of long periods of rest because of the danger of loss of movement in joints The object of rest in bed is to combat the chronic fatigue often present and to direct all of the patient's resources toward overcoming the disease Constant attention to proper positioning of involved joints in bed is necessary to prevent

deformities. Cradles and footboards to keep bedclothes off the lower extremities are useful. In debilitated (weakened) patients constant attention to avoid pressure sores is required.

*Understanding the patient.* Adequate rest is possible only if the patient is relaxed. Since many patients are fearful for the future and dread the possibility of dependence on others, relaxation may be difficult to attain. This is especially true if severe emotional problems (involving relationships with key individuals) are a disturbing factor. A helpful, confident attitude on the part of the nurse may do more in these difficult situations than any other single aspect of treatment. Coupled with this, a sympathetic understanding of the problems raised for the patient by his illness often ensures the patient's cooperation in the treatment program.

*Heat* in the form of hot tub baths, hot packs, or hot soaks is helpful in reducing pain, increasing the mobility of the joints, and reducing painful muscle spasm. Hot baths should be given at a temperature of 102° to 104°F. (38.8° to 40°C.). Patients often need help in getting in and out of tubs. If too disabled, it is wiser to rely on hot wet packs and hot soaks, and omit baths till the patient is able to move with greater ease. Some form of heat is desirable for the involved joints at least two and preferably three times daily. Hot soaks for hands and wrists and ankles and feet are best given for 10 minutes at a temperature of 106°F. (41.1°C.). Hot wet packs are useful because they can be given to almost any area of the body and do not require the patient to leave his bed.

*Exercises* are performed after the application of heat. Active exercises prescribed by the doctor or a physical therapist are of greatest value in maintaining joint motion and muscle function. Passive motion of joints should be done only when prescribed by the doctor and only in patients whose pain is too acute for them to exercise actively. If carefully and skillfully performed, it is helpful in obtaining the confidence of the patient and in encouraging him to start to move his joints himself. There is no substitute for faithful performance of exercises, and the importance of active exercises, after heat, cannot be overemphasized.

*Antirheumatic drugs.* Salicylates, of which the best known is aspirin, are still the most widely used drugs in rheumatoid arthritis. They should be given regularly in the prescribed doses. The newer agents, of which ACTH, cortisone, and hydrocortisone are the most

widely used, are usually more potent in antirheumatic effect. Their exact role in treatment has not yet been decided because of the high incidence of undesirable side effects resulting from their prolonged use, and their apparent inability to influence favorably the basic course of the illness. Injections of gold salts are used by many physicians, but there is no general agreement as to their usefulness in rheumatoid arthritis.

*Diet.* Patients with rheumatoid arthritis should receive a varied, well-balanced diet which contains more than adequate essential minerals and vitamins. Bed patients are usually underweight and often have poor appetites. They should be encouraged to take enough food to gain weight. The addition of supplementary vitamins A, B, C, and D may be advisable. Overweight patients should be on weight-reduction diets, especially if the weight-bearing joints are involved.

*Orthopedic measures* play a large part in the management of patients with joint damage due to rheumatoid arthritis. Plaster shells for the prevention and correction of permanent flexion (bending) of knee joints are extremely useful. Ambulation (walking about) is made possible for patients with severe knee-joint damage by the use of either elastic kneecaps or long-leg braces. Traction (pulling of muscles) is used principally in instances of knee, hip, and cervical spine involvement. Other commonly used aids are foot plates, cock-up splints for hands and wrists, and plaster shells and jackets for patients with back involvement. All apparatus which restricts joint motion should be removed at prescribed intervals so that exercises for the joints concerned can be carried out. Surgical measures to improve function of various joints are helpful in carefully selected patients.

## DEGENERATIVE JOINT DISEASES

This condition is less properly known as *hypertrophic arthritis*, or *osteoarthritis*. It is the result of wear and tear and is encountered most frequently in joints which function improperly because of previous injury or postural defects. Since it is present in nearly all middle-aged and elderly people it is extremely common. The joints most commonly involved are the spine, hips, knees, and the terminal (last) joints of the fingers.

deformities. Cradles and footboards to keep bedclothes off the lower extremities are useful. In debilitated (weakened) patients constant attention to avoid pressure sores is required.

*Understanding the patient.* Adequate rest is possible only if the patient is relaxed. Since many patients are fearful for the future and dread the possibility of dependence on others, relaxation may be difficult to attain. This is especially true if severe emotional problems (involving relationships with key individuals) are a disturbing factor. A helpful, confident attitude on the part of the nurse may do more in these difficult situations than any other single aspect of treatment. Coupled with this, a sympathetic understanding of the problems raised for the patient by his illness often ensures the patient's cooperation in the treatment program.

*Heat* in the form of hot tub baths, hot packs, or hot soaks is helpful in reducing pain, increasing the mobility of the joints, and reducing painful muscle spasm. Hot baths should be given at a temperature of 102° to 104°F. (38.8° to 40°C.). Patients often need help in getting in and out of tubs. If too disabled, it is wiser to rely on hot wet packs and hot soaks, and omit baths till the patient is able to move with greater ease. Some form of heat is desirable for the involved joints at least two and preferably three times daily. Hot soaks for hands and wrists and ankles and feet are best given for 10 minutes at a temperature of 106°F. (41.1°C.). Hot wet packs are useful because they can be given to almost any area of the body and do not require the patient to leave his bed.

*Exercises* are performed after the application of heat. Active exercises prescribed by the doctor or a physical therapist are of greatest value in maintaining joint motion and muscle function. Passive motion of joints should be done only when prescribed by the doctor and only in patients whose pain is too acute for them to exercise actively. If carefully and skillfully performed, it is helpful in obtaining the confidence of the patient and in encouraging him to start to move his joints himself. There is no substitute for faithful performance of exercises, and the importance of active exercise after heat, cannot be overemphasized.

*Antirheumatic drugs.* Salicylates, of which the best known is aspirin, are still the most widely used drugs in rheumatoid arthritis. They should be given regularly in the prescribed doses. The newer agents, of which ACTH, cortisone, and hydrocortisone are the mo

widely used, are usually more potent in antirheumatic effect Their exact role in treatment has not yet been decided because of the high incidence of undesirable side effects resulting from their prolonged use, and their apparent inability to influence favorably the basic course of the illness Injections of gold salts are used by many physicians, but there is no general agreement as to their usefulness in rheumatoid arthritis

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Nursing care in degenerative joint disease does not present the number of difficult problems encountered in rheumatoid arthritis. Usually the debility (weakness) of constitutional illness is not encountered unless complicating illnesses are present. The treatment is directed mainly to the control of obesity by weight-reduction diets and the adequate limitation of physical activity to permit lessening of joint symptoms. Additional reduction of symptoms is accomplished by the use of heat and salicylates. Active and postural exercises are employed to preserve joint and muscle function. The use of orthopedic appliances is sometimes required. Operative treatment of involved joints is occasionally helpful, particularly in those instances of very severe hip involvement.

## *SUMMARY*

Prolonged exercise causes muscle stiffness and, if carried to extremes, may cause serious injury to muscle fibers, tendons, and nerves. Parasites entering the muscle may cause myositis, as in trichinosis. Some muscle paralysis seems to be inherited. Tumors of the muscles are often malignant.

A fracture of a bone may be partial—greenstick—or the ends of the bone may penetrate the skin, allowing the entrance of bacteria. A fracture that penetrates the skin is called a compound fracture. A bone is dislocated when it is pushed out of its capsule. While the fracture is healing, the bones are held in line by a plaster of Paris cast or other mechanical means. The joints near the fracture may be injured and require splinting.

A number of bone and joint diseases are congenital.

Rickets is caused by a dietary deficiency.

The antibiotic drugs have lessened the number of bone infections, and surgery has remedied bone tumors or cysts.

Joint deterioration results in painful arthritis. Although arthritis is commonly regarded as including various types of inflammation of the joints, other diseases are associated with such inflammation as rheumatic fever, gout, and bacterial infections. Diseases caused by wear and tear on joints are more properly called degenerative joint diseases.

Rheumatoid arthritis inflames joints and other tissues. It is com-

monly associated with stress being manifested by anemia, tissue wasting, marked fatigue, elevation of the rate of blood sedimentation, and the formation of subcutaneous nodules

The length of its course varies, but when prolonged and progressive, joint mobility may be gradually lost, especially if prescribed exercises are not kept up Hot applications reduce pain and muscle spasm and increase joint mobility The salicylates, ACTH, cortisone, and hydrocortisone produce the best antirheumatic effects

Diet varies with the needs of the patient, both the underweight and the overweight require well balanced diets, of high- and low-caloric value respectively The diet may need to be supplemented by vitamins

Orthopedic measures are of benefit, traction may be needed, and plaster shells, braces, and elastic kneecaps may make ambulation possible

Degenerative joint diseases are very common, especially in older persons Often no annoying symptoms develop, but these patients should know that joint symptoms are aggravated by strenuous activity These patients may be relieved of much anxiety by being assured that they are not suffering from rheumatoid arthritis.

## Questions

1 In some detail tell what may happen if prolonged or unusual exercise is carried to extremes
2 Give the name of a parasite that may enter a muscle causing myositis
3 What disease of the muscles may be inherited?
4 Describe a "greenstick" fracture
5 What is the bad effect of overlong immobilization or splinting of a joint?
6 Give two examples of congenital abnormalities of the bones and joints
7 Give three examples of developmental abnormalities
8 In what vitamin is a person with rickets deficient?
9 Define arthritis
10 What other diseases are associated with joint inflammation?
11 What is the group of conditions in the joints which are caused by wear and tear called?

12. What tissues other than those in the joints may be affected by rheumatoid arthritis?
13. What are some manifestations of rheumatoid arthritis?
14. In what three respects does the course of rheumatoid arthritis vary?
15. To what extent is nursing care necessary in this disease?
16. Toward what two benefits is the treatment of rheumatoid arthritis directed?
17. How can the movement in joints and the power of muscles be preserved if long-continued bed rest is required?
18. What part do hot applications play in the treatment of rheumatoid arthritis?
19. What joints are most commonly involved in degenerative joint diseases?

# 58

# NURSING CARE OF THE ORTHOPEDIC PATIENT

The orthopedic patient, like every other patient, requires total nursing care Such care is more difficult if the hospital does not have a separate department for orthopedics or adequate orthopedic appliances The nurse needs a good foundation in both physiology and anatomy, she should practice good body mechanics and exert her influence to encourage the patient to follow the course of exercises laid out for him

The condition of the patient may be classed either as a *deformity* or a *disability*, it may be either *congenital* or *acquired* If it is congenital it was present at birth, if it was acquired it may have arisen from one of a number of causes, such as pressure on a nerve trunk or drug poisoning, or it may be the aftermath of infectious disease, such as tuberculosis or poliomyelitis, or a deficiency in diet, fracture, or injury

In the orthopedic department the patient's recovery is promoted and his comfort assured, as far as possible, by the use of orthopedic beds, frames, and appliances, and by the use of weights secured to pulleys to produce traction The fracture bed has such features and provides more comfort for the patient and greater ease in giving nursing care The affected part may be put in a cast, or the patient

may be placed on a frame, or his limb may be suspended; in any case the nurse is constantly vigilant to minister to his needs.

## CASTS

To immobilize a fracture, a cast may be applied. Stockinette and sheet wadding are applied to the part, and plaster of Paris bandages are applied like roller bandages and molded while wet to the extremity; variations in this procedure are needed when other parts of the body are involved.

Fig. 58. Bed panning, first step. (Courtesy of Medichrome–Clay-Adams, New York.)

The cast is put on in the cast room, the limb being held in the correct position by the surgeon. Sometimes, when pain is severe, general anesthesia is necessary; otherwise the patient is made as comfortable as possible with the help of blankets, pillows, and pads. Care is taken that the bandage is not too tight, that it is free from wrinkles, and that it does not constrict the part at any point.

In handling a patient in a wet cast, hospital personnel realize that the cast will crack very easily, for it will not be dry perhaps for two or three days. The cart in which the patient is to be transported is lined with pillows placed so that they will support the con-

tours of the body. When the patient has been returned to his bed, he may be supported by rubber-covered pillows. The calves of the legs are elevated by pillows and the heels do not rest on the bed.

Some surgeons prefer to have the cast dry at room temperature, but the drying may be hastened by the use of a baker, or a light-cradle placed in the bed, with precautions against placing it so near the patient's foot that he will be burned.

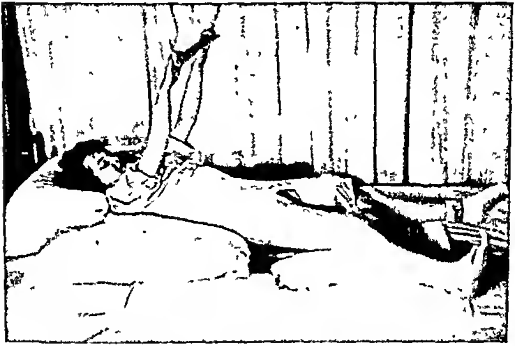

Fig 59 In position on pan, patient comfortable, cast correctly supported (Courtesy of Medichrome-Clay-Adams, New York )

A patient in a body cast or hip spica (a modified figure-of-eight bandage) is not turned for five or six hours or until the plaster of Paris is firmly set.

Certain signs point to danger. The nurse is alert to report these to the doctor. Pain over the back of the foot may mean that there is pressure on the peroneal nerve at the knee. Coldness indicates either that the foot is not getting enough blood, or it may be caused by the nearness of the wet cast. If the part becomes discolored, an effort should be made to find out why. If swelling occurs, circulation may be cut off or the foot may not be elevated enough. Inability to move fingers or toes may indicate constriction, especially

if the patient has been making consistent efforts to flex them. A combination of signs is more serious than a single symptom. Constriction may require that the cast be *bivalved* (split).

After the cast becomes dry the edges are trimmed and bound with adhesive tape. The crumbs are carefully removed from the sheet. The cast is supported in such a way that weight does not bear on the bony prominences, on which pressure sores are likely to develop. A rearrangement of pillows and sandbags allows the weight to be shifted from time to time. An extension to the cast serves well to keep the weight of the bedding from the feet.

Patients in a body cast are placed on fracture beds, with boards placed under the mattress. The patient may be helped to move himself, as required for nursing care, if he can pull on an overhead bar. If he expects to wear the cast for some time, the cast will be bivalved to permit the removal of the upper half while he is being given skin care. The cast is cut away around the groin and buttocks and is padded with stockinette and oiled silk to keep it unsoiled.

The cast is removed by the use of cast shears supplemented by a Murphy knife to cut a groove over bony prominences. Until the cast is removed finally the patient must not be allowed to rotate his spine.

## FRAMES

**Balkan frame.** The Balkan frame is made of wood or piping, with four uprights, one at each corner of the bed, connected by crossbars from which various orthopedic appliances may be suspended. Some Balkan frames are equipped with pulleys through which ropes may be run, such as those used to suspend the Bradford frame.

**Bradford frame.** The Bradford is a rectangular frame made of metal piping, into which is laced or strapped a two- or three-piece canvas cover. The middle section, about 4 in. wide, may be omitted, but if used can be removed for use of the bedpan. The Bradford frame is used to immobilize the back in such diseases as poliomyelitis or tuberculosis of the spine.

The frame may be straight or curved to the left or right to support various types of casts. The straight frame is required when-

ever traction is employed. Traction is the act of drawing or pulling a body over a surface. When combined with suspension, immobilization becomes effective and the position of broken bones may be maintained. The frame operates in accordance with the principles of mechanics.

The frame should be correct in size, extending about 6 in. beyond the head and the feet but only an inch beyond the width of the shoulders. To make the patient comfortable, a cotton drawsheet is firmly pulled and pinned or tucked under the frame. Body alignment must be carefully observed.

The Bradford frame is sometimes suspended from hooks on the Balkan frame at a height convenient for use of the bedpan and for giving bedside care.

The patient lies extended on the frame, his elbows suspended by pulleys, and his legs slightly flexed, if they are not in traction. Since he must not either flex or rotate his spine, he has no pillow under his head. His hips are placed over the open space, so that the bedpan can be used conveniently.

Children are restrained to prevent sudden movements. Muslin straps may be crossed over the patient's shoulders, or a specially designed jacket may be worn.

**Nursing care.** If the patient is not in traction, he may be turned with the permission of the surgeon, but, if he is an adult, three nurses are needed. Two nurses are generally required to turn a child. The adult will have an anterior frame fitted over his body and will be strapped to the posterior frame on which he has been lying. His elbows are held close to his body, and gentle traction is used as the patient is slowly turned onto his abdomen to lie on a hard mattress. The posterior frame is removed and back care is given before returning him to his original position by reversing the process.

*Back care* includes washing the back with soap and water, massaging it with alcohol and water, and inspecting it for signs of decubiti, or pressure sores. A burning, stinging pain is an early sign to be watched for. After a few days the pain is felt no more, owing to nerve paralysis. The numb skin becomes discolored—black in the center with a ring of yellow followed by green. It should, of course, be treated before it reaches this stage when *sloughing* (casting off dead tissues) begins. Besides being clean, the site may be painted

with 5 per cent gentian violet and 5 per cent tannic acid. Certain points are more likely to develop pressure sores than others: back, buttocks, above the ankle bones, at the upper end of the tibia, and on the sole of the foot if it has been pressed against the footrest.

Besides watching the patient the nurse must be sure that the pulleys are not stiff, that the ropes are not knotted or that any cause of friction exists. Such conditions should be reported to the doctor. The weight should never be lifted. To release the traction or to allow the bedding to rest on the ropes may cause fractured bones to get out of place.

If the patient should twist his body or slide down in the bed the traction will become ineffective, since the countertraction is released. If the patient's body is held by a binder so that it will remain near one side of the bed, the binder will be repinned after a bath, for instance, so that the patient's body cannot be drawn in the direction of the traction.

To sum up, the patient is made comfortable by lying flat on the frame, by being kept clean, and by being supported by pillows and pads as well as by suspension of his arms and legs.

## BRACES

A brace is a support given to an affected part to keep it in the desired position so as to prevent or remedy a deformity, or to protect the muscles while permitting them some freedom. It is generally made of steel and leather, and is often applied after the correction of the condition has been accomplished by some other means.

The brace is designed to immobilize the affected part or to relieve it of weight-bearing until it is restored to its normal function. It should fit accurately, provide the support required, be comfortable and not be too heavy. Each brace is made to individual measurement by a bracemaker and is approved for effectiveness and fit by the physician. Both the patient and the nurse should know the names of its parts, and should understand its correct use and care.

Three of the most common braces are those for the lower extremities, those for the back, and those for the upper extremities. The braces for the legs are of several kinds, the short leg, the long leg, and the bilateral leg brace being the main classifications. Back

braces include therapeutic corsets The Taylor back brace supports most of the spinal column, leaving the neck free It is of especial value following fracture of vertebrae or fusion of the spinal column Less extensive supports may suffice if the lower region of the back only is affected, as in some arthritic conditions or when vertebral discs have slipped Upper extremity braces are used following fracture of the humerus They retain the affected arm in such a position that the deltoid muscle is neither stretched nor pulled by gravity

Most braces may be placed properly with less strain and greater ease if the patient is lying either on his back or bis abdomen It is important that the middle of the front and back of the brace be placed over the medial line of the body Back braces are constructed so that they may be anchored by straps under the crest of the hipbone The Taylor back brace supports should be on either side of the vertebral column so that they will not rub against the bony prominences

**Nursing care.** *Skin care* is of especial importance, the skin should be kept scrupulously clean and free from abrasion or pressure sores After washing, the skin should be dried carefully, dusted with powder, and inspected to see if padding with sponge rubber or other soft material is needed to keep the appliance from irritating the skin

Weak or paralyzed limbs should be bandled gently to guard against possible fracture of bones Joints should be supported while a patient is being moved or lifted If a brace is being removed in bed, the limb should be supported by pillows and sand bags in about the same position in which it was held by the brace

*To keep braces clean,* an undergarment, free from folds or wrinkles, may be worn between the brace and the garment Any area likely to be soiled by excreta should be protected by waterproof material Leather surfaces may be cleansed with saddle soap, using very little water Metal parts may be cleansed with naphtha or other cleaning fluids, or with soap and water They should be dried thoroughly to prevent rust Moving parts should be dusted to remove lint before they are oiled The brace should be inspected for worn screws, rivets, or bolts, When not in use the brace can be protected to keep out dirt and moisture

To get the maximum benefit from a brace the patient must wear it according to the doctor's orders—sometimes day and night, some-

times during the day only. If the brace is out of order, several days may go by until it can be repaired. Moreover, if the patient has not been impressed with the value of continual wear, as ordered, he may be inclined to leave it off on occasion. To overcome his reluctance, the patient must be convinced that the brace is beneficial. He should become adept in wearing it so that he will lose his self-consciousness. He may wear loose clothing to make it less conspicuous.

After the doctor has outlined what the patient may be expected to do, the nurse should exert every effort to lead her patient along the road to reach the goal set. Such moral support may be lent by treating the patient as if he were enjoying his usual freedom of movement; by encouraging him to make a confident approach to new activities; and by helping him to visualize himself as contributing to his own return to strength and freedom of locomotion.

An *invalid walker* is helpful when a patient must learn to walk again after a long illness or fracture, as it eliminates fear of tripping or falling. A walker may be rented at places where medical or surgical supplies are sold.

## CRUTCH WALKING

Many disabilities may lead to the use of crutches, some of them promising to be only temporary but others threatening to be permanent. The most common of these disabilities are arthritis, a fractured leg, cerebral hemorrhage, or the amputation of a limb.

Under the direction of the doctor, a team comprising, among others, the registered nurse, the practical nurse, and the physical therapist work in unison to restore the patient to normal living.

Preliminaries to crutch walking begin while the patient is still in bed. His mattress should be firm with boards placed under it. His position in bed should be changed often to relieve fatigue and to prevent his muscles from becoming tight. Various parts of his body may need to be supported so that his posture may be good and so that he may move about somewhat. Later he will sit on the edge of the bed where he may press his feet on his footstool, sit tall, push up, or take other exercises as prescribed by the physical therapist and doctor. The team is concerned not only with his present comfort but also with his future prospects.

To prevent poor posture and deformities crutches should be

measured to fit exactly The first time the measurements are taken the patient is lying flat in bed, but the final measurements are made while he is standing

Crutches are generally made of wood or metal There are several types, each of which is particularly adapted to use under certain conditions The crutch most often used is plain with double uprights, a hand bar, and an underarm bar A second type is the extension crutch, which has a movable hand piece and adjustable vertical uprights Although heavier than the plain crutch it is well adapted to the patient's early efforts to walk with crutches

Crutches should have broad tips of the best quality of rubber to help prevent them from slipping To keep the tips from falling off, they should fit snugly over the ends of the crutches They should be inspected frequently and replaced when worn

The patient should be trained to bear his weight on the palms of his hands, rather than on the underarm area He is said to "walk with his hands" Although the underarm piece may sometimes be covered with sponge rubber, if the crutches have been correctly measured and are used properly they do not require padding under the arms

The doctor orders properly fitting Oxfords to support the patient's feet, he should never wear slippers or walk barefoot

In spite of every encouragement, the patient may hesitate, when the time comes, to try to walk He may be afraid that the crutches will slip, that he is too weak, or that he will be unable to follow the nurse's directions The nurse should try to understand his misgivings and continue to try to build his confidence while he is learning to walk

Before the patient starts out, all obstacles, such as scatter rugs, stools, electric cords, and toys, should be removed from his patb

The gait at which he will go depends on whether he is able to bear his weight either partially or fully on the affected limb Four gaits have been worked out, the one best for the patient will be prescribed by the doctor These four gaits are called

1 The four-point gait, in which the weight is borne by both legs

2 The three point gait, in which the weight is borne partially on the weak leg and fully on the strong one

3 The two point gait in which no weight is placed on the affected leg, but the full weight can be put on the well leg

4. The tripod gait, a shuffling gait, which is all that can be managed if both legs are paralyzed

Generally the physical therapist and the nurse in unison work out crutch-walking techniques and demonstrate the steps to be taken. When the patient is actually ready to begin, the movements he should make are called out. Each gait calls for different directions, which should be understood by the practical nurse, who supervises the walking between visits of the physical therapist. The nurse and one other person should stand in front and in back of the patient to grasp his waist if he seems unsteady.

If the four-point gait, for instance, is to be assumed, the supervisor will call out: "Left crutch forward! Right foot forward! Right crutch forward! Left foot forward!" He should walk slowly, taking short steps, in a regular rhythm.

Naturally the patient who faces the prolonged use of crutches takes a more negative attitude than the one who realizes that they will be required for a short time only. The patient will also be influenced by other factors, including the attitude of his family and nurse. All who come in contact with him should be optimistic, so that he will be inspired to use his crutches, and later his cane, to the best possible advantage.

## PROSTHESES

When a person has lost an arm, a leg, an eye, or a breast, it is sometimes possible to replace the part artificially with a certain degree of satisfaction to the patient. A replacement of a human part is called a prosthesis.

It is always necessary to consider the patient and his background and whether he has lost the member through disease or injury. His occupation, his health, his ability, his need to be self-supporting and active, his strength, and his general health are factors governing the choice of a prosthesis and the approach to his rehabilitation.

There are two types of prostheses: first, the functional type, like the arm with a hook attached, or the prosthetic leg. With the hook the patient may be able to perform about 90 per cent of his former activities; with a well-fitting artificial leg the patient may be able

to walk without even limping Secondly, there is the cosmetic type, whose main purpose is to restore a presentable appearance The prosthetic eye cannot see, but it is practically a match for the patient's good eye and it allows him to appear normal The prosthetic breast keeps the wearer from appearing one-sided The cosmetic hand permits its wearer to regain only about 10 per cent of his former manual skill, but this degree of usefulness may be all that is necessary for an executive or an older person who cares more for the sightliness of his hand than he does for his ability to use it at its highest functional capacity

**The prosthetic leg.** The ultimate aim for the leg amputee is to walk normally while wearing his artificial limb The younger man is much more likely to learn to walk without his crippled condition being apparent than is the elderly patient who approaches the ordeal with fear and uncertainty If the aged patient is also ill with one of the diseases of old age, he will be far more likely to prefer to move about in a wheel chair and to develop the habits of an invalid If he eventually walks, his gait may be rolling and his posture abnormal, especially if poor habits have not been corrected early in his attempts to walk with a prosthesis

Nursing care for the patient who will wear a prosthesis emphasizes.

1 General care for the patient after amputation
2 Hygienic care of the stump
3 Explaining the construction and use of the prosthesis and its care
4 Understanding the mechanics of balancing the body and establishing the best posture and gait possible

Care of the skin of the stump is very important, both before and after the prosthesis has been attached and worn The nurse watches for abrasions, eruptions, and creases in the skin whenever the prosthesis is removed and the stump is cared for The stump should be bathed every day, twice in hot weather It should be carefully dried Airing in the sun is beneficial

The stump of the leg should be covered by a virgin wool sock made to measure The sock should be changed at least once daily and should be washed in mild soapsuds, rinsed, and dried carefully. A sock which has been patched or is worn or roughened should be discarded

From the beginning, the care of the stump involves the intelligent carrying out of provisions to make the skin heal in such a way that it becomes ready to bear the patient's weight.

The patient's bed should be firm and should not sag; boards may be laid under his mattress. Splints may be employed and the foot of the bed may be raised. Any of these measures, if adopted by the surgeon, is designed to avoid the great danger of contracture of the leg muscles. Pillows are not often placed under the stump.

The nurse will supervise the patient as he takes the exercises prescribed by the doctor and directed by the physical therapist.

Bandaging, hot applications, and massage are often ordered to help prevent the development of any further limitations to his rehabilitation.

Any signs of irritation or hardening of the stump should be reported to the physician. The patient will not wear the prosthesis again until the proper adjustment in the socket has been made.

The care of the patient's remaining limb is especially important, since its condition will control his ability to walk normally in the future. For one thing, his heel may become injured in his attempts to push himself up in bed. Various pieces of apparatus may be employed to afford relief and to prevent deformities.

The prosthesis is taken care of properly by cleaning it regularly without wetting it, by oiling the joints, and by seeing that all bolts are tight. Laces and straps are to be renewed as needed. Worn mechanical features are replaced before any accident can result because of them. Instructions concerning the prosthesis are furnished by the manufacturer, and are carried out under the supervision of the doctor.

Physical care to the patient is fortified by the nurse's attitude and bearing. At first the patient is shocked by the amputation. He needs to be reassured constantly that he need not anticipate being a helpless cripple, but that, working with his doctor, physical therapist, and nurse, he can help to restore himself to normal living. The attitude of both the patient and his nurse have a good deal to do with his success in wearing his prosthesis. The nurse should show the utmost consideration for the patient, appreciating his pride and his desire to return to society in the same status as before. She should be tactful and dignified in handling the prosthesis, being careful not to pamper or openly pity her patient.

The patient faces a serious handicap, but, if possible, he must accept the fact Moreover, he should be willing to make all the effort necessary and possible to regain his power and poise In the inevitably dark hours of shock and discouragement, he is indeed grateful to the nurse who can reassure him by her calm confident, and skillful ministrations

## REHABILITATION

The practical nurse may render valuable service in the care of the handicapped, whose number, unfortunately, is increasing with the toll of every holiday week end with every casualty list, and as a result of such crippling diseases as poliomyelitis and arthritis

One of the new ways in which the handicapped patient s situation is approached is based on the realization that the patient can and must help himself, whereas formerly the nurse endeavored to do as much as she could for her patient Of course all of us are naturally sympathetic at the plight of the handicapped especially before his confidence is reborn But today's nurses have been trained to realize that the expression of pity does far more harm than good for it deepens the despondency of the patient, making it harder if not impossible, for him to go forward with courage Nurses in every way try to prevent a negative attitude, for it is one of the worst barriers to rehabilitation

The physician and the physical therapist in the hospital go into consultation to map out a long range program for each patient's rehabilitation Each plan is based on their prediction or estimate of what is the utmost recovery he can make To the best of their ability they visualize the patient as fully as possible restored to his family and circle of friends

They may have to aim at no more than the hope that the patient may learn to live with his handicap as comfortably as he can, or, at the other extreme, they may envision the patient as being able to return to earning his living on a level comparable to that which he formerly occupied Each case presents its unique problems

In conjunction with the doctor, the physical therapist is best qualified to determine what exercises will help the patient most He works with the leader of the nursing team who in turn directs the practical nurse as to how she may help the patient to reach his

goal by instilling hope and courage, as she performs her daily bedside nursing procedures.

The patients who need rehabilitation most are amputees, mental patients who have had operations on the brain, the blind, and those crippled by disease.

Those who have faced one operation may have to undergo still further surgery to effect the best possible result. For instance, amputees often have to have the stump of a limb improved to make it comfortable when a prosthesis is worn. If the leg is not comfortable to walk on, the artificial limb will soon be discarded and the hope of the patient's rehabilitation will fade.

Although rehabilitation is regarded as the third stage in the recovery of the handicapped, were it not for physical therapy in the two earlier stages of treatment—proper position and exercises in bed—later progress in rehabilitation would be impeded.

At the very onset of the patient's stay in bed, his body alignment should be given constant attention. Handicapped patients, especially, have a very understandable tendency to lie cramped in any position which gives them temporary relief from discomfort or pain. However, by changing from one of the positions which have been approved for them to another, their circulation is improved and the possibility of deformity as a result of being bedridden is minimized.

The nurse can help by rearranging pillows to support new positions taken after the patient has rotated his hips or adducted his arms, for instance. She can keep the upper bedding from resting heavily on his ankles and thus throwing his feet into a position which would tend to shorten the Achilles tendon. She can see that the upper bedding is supported either by a footboard, a cradle, or by two large wooden blocks placed at the corners of the foot of the bed.

Exercises in bed have value in four ways:

1. They prevent deformity
2. They stimulate circulation
3. They improve muscle tone, making it possible to strengthen those particular muscles which will be needed when, for instance, crutches are to be used
4. They prevent pressure sores

Under the rehabilitation program in some hospitals, each patient is tested as to his ability to do 100 things necessary in normal living These would include such activities as getting out of bed onto a chair, combing the hair, dressing and feeding himself, walking, going up and down stairs A printed schedule is checked as each activity is mastered by the patient When all activities have been accomplished, either at or away from the hospital, the patient is *regarded as rehabilitated*

For the most part, the patient's rehabilitation is carried on away from the hospital, which he naturally associates with pain and helplessness Often he will live at home where a practical nurse may be in attendance

Whether in the hospital or in the private home, the nurse must be firm in her gentle insistence that the patient follow instructions with persistence and courage In the home she should follow the principle and practice of the hospital in putting his program of recovery on a 24-hour basis, making his sleeping as well as his waking hours contribute to his well-being

She must observe and record all the facts which the doctor regards as significant She will be able to anticipate the patient's possible regression to infantile behavior, if it occurs She will hide from him anything which might wipe out his *will to live*, in order to prevent his moral and mental collapse

Everyday he will need understanding and encouragement as well as watchfulness to see that he is following instructions and making the necessary effort demanded She, as well as he, must keep in clear perspective the time when, in so far as possible, he will once more resume his place in the world

## *SUMMARY*

The orthopedic patient is faced with a deformity or disability—congenital or acquired—which he must face, whether it be temporary or permanent He needs a nursing team whose knowledge includes not only physiology, anatomy, and hygiene, but also elementary physics and good body mechanics

The comfort of the orthopedic patient is promoted by the use

of various appliances, including casts, braces, crutches, orthopedic beds, and frames employing suspension, traction, and counter-traction.

Casts, braces, crutches, and prostheses are made to measure, are approved by the surgeon, and are adjusted as indicated.

Special attention to skin care is always to be given, but the need of effective measures to prevent the development of pressure sores in orthopedic patients is urgent. Back care is given regularly.

A patient whose back is to be immobilized is placed on a Bradford frame, which may either be suspended from a Balkan frame or set on legs on a firm mattress at a height convenient for nursing care and the use of the bedpan. Daily inspection of the apparatus is required to ensure safety.

Braces are applied chiefly to upper and lower extremities and to the back to hold the affected part in position. They must be kept clean and in good repair, and should be worn as constantly as ordered.

Crutches may be needed either temporarily or permanently. The disability leading to their use may have been arthritis, a fractured leg, cerebral hemorrhage, or amputation.

A replacement of a human part—an arm, leg, eye, or breast—is called a prosthesis. It may be functional, like the arm with a hook attached, or it may be cosmetic, like the prosthetic breast or the cosmetic hand. The choice is governed by the patient's occupation, his health, his ability, his need to be self-supporting and active, his strength and general health.

The ultimate aim of the wearer of an artificial leg is to walk normally. The younger person is more likely than the elderly patient to make enough effort to master the gait to which he is best suited.

Good nursing emphasizes the need of conscientious general care, with especial attention to the stump, a clear and optimistic explanation of the purpose and construction of the prosthesis, and the mechanics of balancing the body and attaining the recommended posture and gait.

The upkeep of socks and shoes is essential to maintaining limbs in a healthy condition. The health of the remaining limb is of the utmost concern. The prosthesis should be kept clean, its joints oiled, and laces and straps should be replaced if worn or broken.

Proper position in bed and exercises taken in bed are important preliminaries to rehabilitation The patient is taught that he can help himself to recovery He is encouraged to do as much as he can for himself

The physician and the physical therapist plan a long range program, based on their estimate of what is the utmost recovery the patient can make Each patient presents a unique problem The leader of the nursing team works with them so that she may direct the nursing team

The patients most in need of rehabilitation are amputees, mental patients who have had brain operations, the blind, and those crippled by disease

Their progress in rehabilitation is measured by their ability to perform definite activities of normal living Much of the rehabilitation program is worked out away from the hospital—often in the patient's home, where the practical nurse assumes most of the responsibilities for building patient morale She needs to have understanding, courage, watchfulness, and a clear concept of the patient's goal

## Questions

1 Name three conditions which may be causes of crippling in children
2 What precautions are necessary to prevent a damp or wet cast from cracking?
3 Name five danger signs in the patient who is in a cast
4 What is meant by the cast being bivalved?
5 How may a cast be removed?
6 How large should a Bradford frame be?
7 For what purpose is the middle section of the canvas cover made removable?
8 How may a child be restrained on a Bradford frame?
9 Who issues an order for a patient on a Bradford frame to be turned?
10 How many persons are needed to turn an adult person on a Bradford frame?
11 How is the patient protected from slipping before being turned?
12 Describe the appearance of the skin at the site of a developing pressure sore

13. Give an illustration of countertraction. Why should it always be maintained?
14. At what stage is a brace generally applied?
15. Name the three most common braces.
16. In what position should the patient be when the brace is applied?
17. Name four disabilities leading to the need to use crutches.
18. Name and describe some common types of crutches.
19. Discuss the use of rubber tips on crutches.
20. What is meant by the expression: "He walks with his hands"?
21. What are the advantages and disadvantages of the cosmetic hand?
22. Describe care of the stump of an amputated leg.
23. Discuss the sock worn over the stump.
24. What steps may be taken to prevent contracture under the stump?
25. What is meant by mapping out a long-range program for the rehabilitation of the handicapped?
26. What classes of patients are most in need of rehabilitation?
27. Describe the basic attitude of the nurse in the home of a patient to be rehabilitated.

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# GLOSSARY

A glossary is a collection of explanations of words selected from a particular field of knowledge This glossary is comprised of words useful to the nurse It also includes the more frequently used prefixes and suffixes The prefixes are followed by a hyphen as are the combining forms, and the suffixes are preceded by a hyphen However, many of these word elements may be combined in various ways with a root (the basic part that forms a word or words) or roots to form a new word For instance, hyper- a prefix meaning *abnormal* or *excessive,* when combined with the root tensio, meaning a *stretching* or *tensing,* forms the new word hypertension—meaning excessive tension—a term usually applied to high blood pressure Prefixes and suffixes may be combined, also, to form new words, for example, epi-, a prefix meaning *above* or *on the outside,* when combined with the suffix -derm, meaning *skin,* forms a new word when the appropriate ending is added, to produce epidermis, which means the skin above (other skin layers), or the skin on the outside

A knowledge of the meaning of roots, prefixes, combining forms, and suffixes, particularly those derived from the Greek and Latin, is of great value to the nurse in discerning at a glance the meaning of a word in which one or more elements are found Sometimes the form of a word element is modified to make the word containing it more easily pronounceable Thus ad-, meaning *to,* is used without change in *adduct,* but is changed to ac- in *accessory,* and to af- in *afferent*

Each word in this glossary is divided into syllables, and the quality of accent on the syllable or syllables stressed One accent mark is usually found in the shorter words, and some prefixes, combining forms, and suffixes When a syllable carries two accent marks, and

another carries only one accent mark, the former is given greater stress than the latter.

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a, an- a prefix equivalent to *un-* or *in-* signifying *absence, lack, -less, not*

ab-, a-, abs- a prefix meaning *from,* or *away,* or signifying separation or departure

ab·duct draw away from the middle line

ab·nor′mal not normal; not conforming with the natural or general rule

ab′scess localized collection of pus in any part of the body

ab·sorb′ take in; imbibe, as fluids or gases; pass through the skin, as ultraviolet rays; neutralize an acid

ac·cel″er·a′tion quickening, as of the pulse or respiration; change of velocity or direction of movement

ac·ces′so·ry auxiliary, assisting; applied to a lesser organ or part which supplements a similar organ or part

ac·cu′mu·la″tion gathering together; storing up; massing in one place

a·cute′ sharp; severe; not chronic; having a rapid onset, a short course, and pronounced symptoms

ad- a prefix signifying *to, toward, near, addition to,* and *more intense*

ad·duct′ draw toward the median or middle line of a body

ad·he′sive sticky; tenacious; tending to cling or stick; a plaster

af′fer·rent carrying toward; tending toward the center

ag′gra·vate to make worse or more severe; irritate; intensify

-al′gi-a a suffix denoting *pain*

a·lign′ment formation in a line

al′ler·gy a modified sensitiveness or hypersensitiveness to a substance or substances of protein or nonprotein character, introduction

of which into the body may cause a variety of symptoms, such as bronchial asthma, urticaria (hives), dermatitis

am'bu la to"ry, am'bu lant walking or able to walk, designating a patient not confined to bed

a men"or rhe'a absence of menstruation

am ne'si a loss of memory, especially of the ideas represented by words

am'phi-, amph- a prefix signifying *both, of both kinds, on both sides, about, around*

am"pu ta'tion the removal, generally by surgical means, of a limb, wholly or in part, a projecting part, or an organ of the body

an'a- a prefix meaning *back, up, again, through, excessively*

-a'na a suffix meaning *belonging to, connected with, derived from*

an"es the'si a loss of sensation

an'gi o a combining form meaning a *vessel* or denoting a *blood vessel*, or *pertaining to* or *covered by* (such) *a vessel*

an'o- a combining form meaning *up, upper, upward*

an'te- a prefix denoting *before, preceding, in front of, prior to, anterior to*

an' te na'tal prenatal, before birth

an'ti-, ant- a prefix meaning *against, in return, opposed to, instead, counter*

an u'ri a suppression of urine

a'nus the termination of the rectum, the outlet of the alimentary canal

ap'a thy indifference, lack of feeling or passion

a'pex summit or top of anything, point or extremity of a cone

a pha'si a loss or impairment of the capacity to use words as symbols of ideas

aq'ua water

a'que ous watery

ar"o mat'ic having a spicy odor, characterized by a fragrant, spicy taste and odor, as cinnamon, ginger, or the essential oils

ar te'ri o , arteri- a combining form signifying *artery, arterial*

ar'thro-, arthr- a combining form denoting *relation to the joints*

as phyx'i a suffocation, the suspension of life due to deprivation of oxygen

as pi ra'tion the act of sucking up or sucking in, act of using an aspirator, withdrawing fluids or gases from a cavity by suction

as sim"i la'tion process of transforming food into a state suitable for absorption by the circulation and conversion into body tissue

a stig'ma tism the faulty vision which results from irregularity in

the curvature of one or more refractive surfaces (cornea, anterior and posterior surfaces of the lens) of the eye

as·trin′gent an agent that produces contraction of organic tissues, or that arrests hemorrhages; binding; causing contraction

a′tri·um the first chamber of the heart, which receives the blood from the veins

at′ro·phy a wasting away from want of nourishment; becoming smaller in bulk; or stoppage in development incidental to the normal development of a plant or animal

au′di·o-, au′di·to- a combining form denoting *pertaining to hearing*

au′ral relating to the ear or to the hearing

au′to-, aut- a combining form meaning *pertaining to, by,* or *for oneself or the same individual*

au′to·clave an apparatus for sterilizing objects by steam heat at high pressure

av″oir·du·pois′ the English system of weights and measures, such as *ounce, pound, ton, quort, bushel*

ax·il′la the armpit

ba·cil′lus (plural ba·cil′li) a genus (biological classification) of microorganisms that are rod-shaped, and may occur as slender, short, straight, or slightly bent rods

bac·te′ri·um (plural bac·te′ri·a) any of a very large group of one-celled microorganisms, including *bocilli, spirillo, cocci*

ba′sal met″a·bol′ic rate (BMR) the amount of energy expended per unit of time under basal conditions; usually expressed as large calories per square meter of body surface per hour

base (adjectives ba′sal, ba′sic, bas′ilar) the lowest part of a body or the foundation upon which anything rests

bas″si·net′ an infant's crib or bed; a wicker basket with or without a hood at one end

be·nign, be·nig′nant not endangering health or life; not malignant, innocent; applied to certain tumors

bi- a prefix meaning *two, twice, double*

b.i.d. (Latin *bis in die*) twice daily

bi·lat′er·al relating to two sides; pertaining to or affecting both sides of the body

bi′o-, bi- a combining form denoting *relation to,* or *connection with, life, vital phenomena,* or *living organisms*

bi′op·sy the excision, during life, of tissue to establish the diagnosis by means of a microscopic examination of the excised piece

bot′u·lism food poisoning due to production of toxins by a micro-

organism in improperly canned foods, characterized by the abrupt onset of violent symptoms, often fatal

brad'y- a combining form meaning *slow*

brad'y car'di a slowness of the heart, manifested in a pulse rate usually less than 60 per minute

bron'cho-, bronch- a combining form signifying *relating to a bronchus* or *to the bronchi*

bron'chus one of the primary branches of the trachea or such of its branches within the lung as contain cartilage in their walls

but'tock one of the two fleshy parts of the body posterior to the hip joints, formed by the masses of the gluteal muscles

ca dav'er a dead body, especially that of a human being, a corpse

cal'lus an area of hardened and thickened skin, new growth of incompletely solidified bony tissue surrounding the bone ends in fracture

cal'o rie a heat unit, the amount of heat required to raise the temperature of 1 kg of water from 0° to 1°C

cap'sule a membranous sac enclosing a part, an envelope surrounding certain organisms, a soluble shell for administering medicines

car"ci no'ma an epithelial tumor which is malignant, cancer

car'di ac relating to the heart, a person with a heart lesion, a tonic acting especially on the heart

car'di o-, cardi- a combining form denoting *of*, or *pertaining to, the heart, cardiac*

ca'ri es death of bone or teeth, corresponding to ulceration in the soft tissues

car'ri er a normal person or one convalescing from an infectious disease who shows no signs of symptoms of the disease but who harbors and expels the microorganisms, and so spreads the disease

cat'a ract partial or complete opacity (nontransparency) of the crystalline lens or its capsule

cath'e ter a hollow tube of metal, glass, hard or soft rubber, rubberized silk, etc, for introduction into a cavity through a narrow canal, for the purpose of discharging the fluid contents of a cavity, such as passing a catheter into the bladder through the urethra to relieve urinary retention

caus'tic very irritant, burning capable of destroying tissue, such as *carbolic acid*

cav'i ty a hole or hollow space

ce'li ac abdominal pertaining to the belly

cen'ti grade having 100 divisions or degrees abbreviated C

cen′ti·me″ter the hundredth part of a meter, equal to 0.3937 (or about 2/5) inch

ce·phal′ic pertaining to the head

ceph′a·lo-, ceph′al- a combining form denoting *the head*

cer″e·bel′lum the inferior part of the brain lying below the cerebrum and above the pons and medulla

cer′e·bro-, cereber- a combining form denoting *the cerebrum* or *the brain*

cer′e·brum the chief portion of the brain, occupying the whole upper part of the cranium

cer′vix a constricting portion or neck; neck of the bladder; neck of the uterus

Ce·sar′e·an section delivery of the fetus (unborn baby) through an abdominal incision

chan′cre (chan′cer) the lesion (ulcer) formed at the side of primary inoculation; generally refers to the initial lesion of syphilis

Cheyne-Stokes res″pi·ra′tion periods of stertorous respiration interrupted by periods of apnea (no breathing) seen in cerebral arteriosclerosis, senility, heart disease, and a few other similar conditions

chig′ger a larval mite whose bite causes severe inflammatory lesions in man and warm-blooded animals

chol′o-, chol- a combining form denoting *bile* or *gall*

chron′ic long-continued; of long duration; opposed to *acute*

cir′cum- a prefix meaning *around, about, on all sides*

cir·rho′sis a chronic, progressive disease of the liver

clau″di·ca′tion lameness

co·ag″u·la′tion the formation of a clot, as in blood

col′ic pertaining to the colon; cramp-like abdominal pains, seen in babies who have swallowed air

col·lapse′ extreme depression, exhaustion, or prostration, as in shock or hemorrhage; sagging of an organ, or falling together of its walls

col·lo′di·on a dressing for wounds, made by dissolving gun cotton in ether and alcohol

co·los′to·my the formation of an artificial anus in the anterior (front) abdominal wall or loin, with an opening into the colon

co′ma unconsciousness from which the patient cannot be aroused

com′a·tose in a condition of coma

com·pat″i·bil′i·ty the power of a medicine or a substance in a medicine to mix with another without destructive chemical change or loss of therapeutic power

com′press a folded piece of cloth, gauze, or pad of other soft material, used to cover the dressing of wounds, and so placed by aid

of the bandage to press on any part, a folded cloth applied, wet or dry, hot or cold, to a part to allay inflammation and swelling, to press or squeeze together

con- a prefix meaning *with, together*

con″den sa′tion making more compact or dense

con duc′tion the passage or transfer of electrons, heat, or sound waves through suitable media, or of nerve and muscle impulses through those tissues

con gen′i tal existing at birth

con ges′tion an abnormal collection of blood in a part, or organ

con″junc ti′va the mucous membrane covering the fore part of the globe of the eye, reflected upon the lids and extending to their free edges

con sist′en cy coherence, union, holding together evenly or in harmony

con ta′gion the process whereby disease spreads from one person to another, by direct or indirect human contact or by an inter mediate agency, the germ or virus which causes a communicable disease

con′tra- a prefix meaning *against, contrary* or *in opposition*

con″tra in″di ca′tion, con″tra in′di cant a symptom, indication, or condition in which a remedy or a method of treatment is in advisable

con tu′sion a bruise, an injury in which the skin is not broken

cor′ne a the transparent front portion of the eyeball above the iris and pupil

cor′o nar″y a term applied to vessels, nerves, or attachments that encircle a part of an organ

cor ro′sive a substance that destroys organic tissue either by direct chemical means or by causing inflammation, eating away

co ry′za common cold

cos′to- a combining form denoting *a rib*

cra′ni um the part of the skull that contains the brain, its mem branes and vessels

cri′sis a turning point, as that of a disease or fever, especially, the sudden favorable termination of the acute symptoms of an infectious disease

cryp′to-, crypt- a combining form meaning *hidden, covered, secret*

cul ture growth of microorganisms on artificial mediums, a group of microorganisms grown in an artifical medium

cur′va ture a bending or curving

cu ta′ne ous pertaining to the skin

cu′ti- a combining form meaning *skin*

cy′a no , cyan- a combining form meaning *dark blue*

cy′′a·no′sis a bluish tinge in the color of mucous membranes and skin

cyst a sac with a distinct wall, containing fluid or other material, normal or pathological in nature

cys′to-, cyst- a combining form denoting *likness to* or *connection with a bladder* or *cyst*

-cyte a suffix denoting *a cell*

cy′to-, cyt- a combining form denoting *connection with, relation to a cell* or *cells*

de- a prefix denoting *down, away from; separation, off, away*

de·bil′i·ty weakness

de·bris′ (in dentistry) soft foreign material loosely attached to the surface of a tooth

de·cu′bi·tus a bedsore

de′′hy·dra′tion the removal of water, as from the body or a tissue

de·lir′i·um a condition of mental excitement, confusion, usually with severe mental symptoms

de·lu′sion a belief maintained in face of indisputable evidence to the contrary

demi- a prefix signifying *half*

de-mul′cent a soothing substance

-derm suffix denoting *skin*

der′mato-, dermat- a combining form meaning *skin*

di′a-, di- a prefix denoting *through, between, apart, asunder,* or *across*

di′′ag·no′sis the art or the act of determining the nature of a disease

di′a·ther′′my (medical) that form in which the tissues are heated to a point less than a destructive temperature

dif·fu′sion spreading out

dig′it·al of or pertaining to the digits or fingers

dis·ten′tion state of being stretched, swollen

di′′u·ret′ic increasing the volume of urine; an agent that increases the volume of urine

dor′sal pertaining to the back or to the posterior part of an organ

douche a stream of water or air directed against the body or into a body cavity

du′′o·de′num the first part of the small intestine, immediately following the lower portion of the stomach

dys- a prefix meaning ***hard*** or ***ill***; used to signify *ill, bad, difficult*

dys′′men·or·rhe′a difficult or painful menstruation

e- a prefix signifying ***without**, out, out of, from*

ec- a prefix denoting *out of*

ec″chy mo′sis a letting out of blood into the subcutaneous tissues

ec′to-, ect- a combining form signifying *without, upon the outer side*

ec′to derm the outer layer of skin, epidermis

-ec′to my a combining form denoting *surgical removal*

e de′ma dropsy accumulation of excessive amounts of fluid in the tissue spaces

em′bo lism the obstruction of a blood vessel, especially an artery, by a transported clot

em′bry o the young organism in the early stage of development as the unborn infant in the womb up to the third month of pregnancy

em′e sis vomiting

e met′ic an agent causing vomiting

en′do-, end- a combining form denoting *within*

en″do car di′tis inflammation of the living membrane of the heart and its valves

en′do crine secreting internally, any one of the ductless glands, such as the thyroid, pituitary, and adrenals whose secretions pass directly into the blood stream

en″do the′li um the lining of the heart, blood vessels, and lymph vessels

en′ter o-, enter- a combining form signifying *the intestine*

en″u re′sis involuntarily wetting the bed, usually while asleep

en′zyme a chemical substance formed by living cells that have a specific action in promoting a chemical change in other substances in the body

ep′i-, ep- a prefix meaning *upon, beside, above, over, on the outside*

ep′i der′mis, -ep i derm outer skin

ep″i the li um the tissue that forms the epidermis and lines hollow organs and all passages of the respiratory, digestive, and genitourinary systems

e rup′tion a bursting forth, the breaking out of a skin rash, a skin rash, the emergence of a tooth through the gum

er″y the′ma a redness of the skin occurring in patches of varying sizes and shapes

ex- a prefix denoting *beyond, from, off, out of, without*

ex co ri a′tion abrasion (rubbed off) of a portion of the skin

ex″oph thal′mos abnormal protrusion (bulging out) of the eye ball from the orbit

ex ten′sion a straightening out, especially the muscular movement of which a flexed limb is made straight

ex·ter'nal on the outside; on or near the outside of the body; away from the center or middle line of the body

ex'tra- a prefix denoting *outside of, beyond the scope of*

fe'brile pertaining to or characterized by fever

fe'ces the excretions of the bowels

fet'id having a foul odor

fis'sure a grove or cleft; applied to the clefts or grooves in various organs, as cracks in the skin or ulcers in mucous membranes

fis'tu·la abnormal channel between two hollow organs or between one hollow organ and the surface

flat'u·lence the presence of abnormal amounts of gas in the bowels

flex'ion the process of bending

fo'cus the principal seat of a disease

fol'li·cle a small secretory cavity; a simple tubular gland, especially of the skin

fo"men·ta'tion the application of heat and moisture to a part to relieve pain or reduce inflammation

fore- a prefix denoting *before* (in time or place), in front

for'mu·la prescribed method; recipe or prescription

frac'ture the breaking of a bone or cartilage

fu"mi·ga'tion disinfection by exposure to fumes of a vaporized disinfectant

fun'gus one of the forms of plant life of a lower order than true, green plants, of which one group causes skin diseases, and other disturbances

fu'run·cle a boil

fu'sion act of melting; process of uniting

gan'gli·on a group of nerve cell bodies, usually located outside of the brain and spinal cord

gan'grene death of a part due to failure of the blood supply, to disease, or to injury

gas'tro-, gastr- a combining form meaning stomach or belly

gas·trot'o·my incision into the stomach

ga"vage' feeding through a stomach tube

gen"i·ta'li·a the organs of generation of men and women

germ a small bit of protoplasm capable of developing into a new individual, particulary an egg, spore, or seed; any microorganism, especially any of the pathogenic bacteria

glu·te'al pertaining to the buttocks

gon'ad a sexual gland; a testicle, an ovary

gross large, bulky, coarse; something that can be seen without the aid of a microscope

gyn″e col′o gy the science of the diseases of women, particularly those affecting the sexual organs

gyn′o-, gyn- a combining form denoting *woman*

hal lu″ci na′tion a delusional (false) perception of an object or phenomenon which has no external existence

hem′i- a prefix signifying *half*

hem″i ple′gi a paralysis of one side of the body

he′mo-, hae′mo- a combining form signifying *of* or *pertaining to the blood*

he′mo cyte a blood cell

hem′or rhoids enlarged and varicose condition of the veins of the lower portion of the rectum and the tissues about the anus

her′ni a rupture, abnormal protrusion of an organ or a part through the containing wall of its cavity, beyond its normal confines

her′pes an acute inflammatory disease of the skin or mucous membrane

het′er o-, heter- a combining form meaning *other, other than usual, different*

het″er o ge′ne ous differing in kinds of nature, not homogenous

hor′mone chemical substance secreted by an endocrine gland into the blood stream in order to bring about specific changes in distant cells and organs

hy′dro , hydr- a combining form meaning *water*

hy″dro pho′bi a morbid fear of water, rabies

hy′per- a prefix signifying abnormal or excessive

hy″per ten′sion excessive tension, usually synonymous with high blood pressure

hy′po-, hyp- a prefix denoting *deficiency or lack, below or beneath*

hy″po der′mic placed or introduced beneath the skin, injection under the skin

hys″ter ec′to my total or partial removal of the uterus

hys′ter o-, hyster- a combining form denoting *connection with, or relation to, the uterus*

-ic a suffix signifying *of* or *pertaining to*

id′i o- a combining form meaning *one's own, separate, distinct*

id″i o syn′cra sy a peculiarity of constitution that makes an individual react differently from most persons to drugs or treatments

im- (in-) a prefix signifying *not*

im′ma ture″ not yet adult, not fully developed

im mo″bi li za′tion the act of making motionless, as by splints or casts

im mu′ni ty the state of increased resistance to the effects of

absorption of foreign toxic substances (microorganisms, viruses, and some vegetable poisons)

im·pact'ed wedged in tightly

in- a prefix signifying *not;* also *in, within, into, toward, on*

in·ci'sion a cut or wound of the body tissue

in"co·her'ence lack of systematic ideas or of language

in·con'ti·nence lack of voluntary power to control the excretion of feces from the rectum or urine from the bladder

in"du·ra'tion the hardening of a tissue or part; a hardened area of tissue

in"flam·ma'tion the totality of reactions of a living tissue regardless of the causative factor; characterized locally by heat, swelling, redness, and pain

in'fra- a prefix signifying *beneath, below, inferior,* or *within*

in·fu'sion the process of extracting the active principles of a vegetable substance by water that has been heated to boiling point

in·ges'tion the act of taking food or other substances, solid or liquid form, into the body

in·gre'di·ent any substance forming part of a compound

in'gui·nal relating to the groin

in"ha·la'tion the breathing of air or other vapor into the lungs; a medicinal substance to be employed by inhalation

in·hib'it to restrain or suppress

in·oc"u·la'tion the introduction of microorganisms, or of a vaccine, or serum into living organisms

in·sid'i·ous beginning gradually, almost without notice, as a disease whose onset is gradual

in·som'ni·a inability to fall asleep; want of sleep

in"stil·la'tion the pouring in of a fluid, drop by drop

in'ter- a prefix meaning *between* or *among, within*

in'ter·me"di·ate between extremes or limits

in"ter·mit'tent characterized by intervals; as fevers that occur at intervals

in·ter'nal located within; that inside

in'tra- a prefix signifying *within* or *into; situated within*

in'tro- a prefix denoting *within, into, inward*

in"tro·spec'tion looking inward; contemplation of an idea or experience

in·unc'tion an act of rubbing a fatty or oily preparation into the skin

ir·ra"di·a'tion subject to the action of rays; diffusion of a nerve impulse

-ism (-ize) a suffix meaning *action, characteristic of,* (medicine) *an abnormal condition from excess of a thing* (specified), as alcoholism

i'so-, is- a combining form signifying *equality, uniformity, identity, similarity*

-i'tis a suffix (in medicine) meaning *a disease,* specifically *an inflammatory disease of a part* (named), as laryngitis

ko'sher refers to foods prepared or animals slaughtered according to Jewish religious laws, and therefore ritually clean

la'bi a (plural of la'bi um) means *lips, labia majora* are the two cutaneous folds extending from the mons veneris to the perineum, *labia minora* are the two inner membranous folds guarding the entrance to the vulva

lac"er·a'tion a tear, a rupture

lat'er al belonging to, or pertaining to the side

la vage' irrigation of an organ

le'sion an injury, wound, or morbid change in living tissue

leu'co-, leuc- see leuko-

leu'ko-, leuk- a combining form meaning *white, colorless*

leu'ko cyte white or colorless blood cell

li ga'tion the operation of tying, especially arteries, veins, or ducts, with some form of knotted ligature

li'ter the metric unit of volume, which is equal to 1 056 U S quarts

lith'o-, lith- a combining form meaning *stone, calculus*

li thot'o my the removal of a stone (calculus) through an operative incision, usually from the urinary bladder

lo'cal limited to one part or place, not general

lymph the fluid in the lymphatic vessels and lymph spaces

-lysis a combining form signifying *dissolving, dissolution*

mac'ro-, macr- a combining form meaning *large, an enlargement* (in medicine)

mac'ro cyte giant red blood cell

mal- a combining form denoting, *ill, bad*

mal'a dy illness or disease

ma'lar pertaining to the cheek or to the zygoma

ma·lig'nant threatening life, as malignant tumors, such as cancer, or gangrene, anthrax, infectious endocarditis

mal"nu·tri'tion undernourishment, imperfect nutrition

ma'ni·a a psychosis characterized by considerable emotional excitement, flight of ideas, hallucinations, delusions, disturbance of orientation, extreme motor restlessness, and incessant talking

ma nip"u la'tion handling, the treatment of diseases or injuries

of the joints, mainly by the performance of certain passive movements of the injured part

mas·tec'to·my the surgical removal of the breast

mas·ti'tis inflammation of the breast

mas'to-, mast- a combining form signifying the breast; also, denoting *mastoid*

me·a'tus a passage, a channel, an orifice (opening)

me'di·al internal; toward the mid-line of the body

me'di·an in the middle of the body; mid-line

mem'brane a thin layer of tissue surrounding a part or lining a cavity or extending between two parts

men'o a combining form meaning *month*; denotes *relation to the menses*

men'o·pause the physiologic cessation of menstruation, usually between 45 and 50 years

men'ses the recurrent monthly discharge of blood from the uterus, between puberty and menopause

mes'o-, mes- a combining form denoting *middle*

mes'o·derm the middle layer of skin, between the ectoderm and entoderm

mi'cro-, micr- a combining form denoting *small; very small* (microscopic); *abnormally small* (in medicine)

mi''cro·bi·ol'o·gy the science of the nature, life, and activities of microorganisms

mic''tu·ri'tion the act of passing urine

mon'o-, mon- a combining form meaning *single one*, or *alone*

mon·ox'ide an oxide containing a single oxygen atom

mons (in anatomy) an eminence, mound

mons veneris the mons pubis of the female

mor'bid relating to disease or diseased parts

mu'cus the viscid (sticky) fluid secreted by mucous membranes

my'o-, my- a combining form denoting *a muscle*

my''o·si'tis inflammation of muscle, usually restricted to voluntary muscle

nar·cot'ic a drug that produces stupor, complete insensibility, or sleep, such as opium or chloral

na'res (singular na'ris) the nostrils

na''so·phar'ynx the part of the pharynx above the soft palate (upper, back part of mouth); the cavity back of the nostrils and above the back part of the mouth

nau'se·a sensation of sickness; sick at stomach with tendency to vomit

ne cro'sis the pathological death of a cell

ne'o-, ne- a combining form denoting *new, recent, young*

ne phri tis inflammation of the kidney

neph'ro-, nephr- a combining form meaning *kidney*

neu'ro-, neur- a combining form signifying *a nerve, nervous tissue, or the nervous system*

neu rol'o gy the medical science that deals with the anatomy, physiology, and pathology of the nervous system

non- a prefix meaning *not*

norm a standard

nor'mal perfect according to some ideal standard, well, not handicapped

normal saline solution a solution which contains 0 85 per cent sodium chloride in water To make, put 8½ parts of sodium chloride (common table salt) in 1000 cc water, or 1 level teaspoonful salt in 2 tumblers (glasses) of water, or 1 level dessertspoonful salt in 4 tumblers of water

nu'cle us a structure of specialized substance and function within a cell

o bese' very fat, corpulent

ob stet'rics the branch of medicine that cares for women during pregnancy, labor, and shortly following birth of the baby

oc clu'sion the state of being closed or shut, as in an artery or vein

oc'u lar pertaining to or relating to the eye

-oid a suffix signifying *like* or *resembling*

-ol'o gy a combining form denoting *a science*, or *a special line of study*

-o'ma a suffix signifying a *morbid affection,* as a tumor or swelling

o oph'o ro, oöphor- a combining form meaning *an ovary* or *ovarian*

oph thal'mo-, ophthalm- a combining form signifying *the eyes*

oph"thal mol'o gy the science of the anatomy, physiology, and diseases of the eye

op'ti mum the temperature or other condition at which vital processes are carried on with the greatest activity

o'ral pertaining to the mouth

or'i fice an opening, an entrance to a cavity, as the mouth

or'tho-, orth- a combining form denoting *straight, normal,* or *true*

or"tho pe'dics relating to the correction of deformities, especially those of the limbs, and bones, that branch of surgery relating to the correction of deformities

-o'sis a suffix signifying a *state or condition of;* as a *diseased condition* (in pathology)

os·mo'sis the passage of solvent molecules through a semipermeable membrane from a weaker to a stronger solution

os'se·ous bony; like or resembling bone

os'te·o-, os'te- a combining form meaning *bone*

os"te·o·my"e·li'tis inflammation of the marrow of bone

o'to-, ot- a combining form meaning *the ear*

pal'lor paleness, especially of the skin and the mucous membranes

pal"pi·ta'tion a fluttering or throbbing, particularly of the heart

pan- a combining form meaning *all, every,* but in medicine it is used specifically to mean *general* or *affecting all or many parts*

pan"a·ce'a a cure-all

pa·pil'la a pimple or pustule

pap'ule a small, clearly defined, solid elevation of the skin, varying in size from that of a pin point to that of a split pea

par'a-, par- a prefix signifying *beyond, beside, near*

pa·ral'y·sis loss of nervous function, especially of the function of motor efferent nerves, thus disturbing voluntary motor activity

par'a·site an organism (plant or animal) living more or less continuously upon or within and at the expense of another organism

par·en'ter·al outside the intestine; not by way of the alimentary tract; a subcutaneous, intravenous, or intrasternal injection

par"o·ti'tis mumps; inflammation of the parotid gland(s)

par'ox·ysm a sudden attack; a sudden increase in the severity of existing symptoms; a spasm or fit; a convulsion

path'o-, path- a combining form meaning *disease, pathologic*

pa·thol'o·gy that branch of medical science dealing with structural or functional changes caused by disease

pe"di·at'rics that branch of medicine dealing with children's diseases

pe·dic"u·lo'sis a skin disease due to the infestation of lice, characterized by intense itching and skin lesions

per- a prefix signifying *throughout, completely, thoroughly, over,* or *very, extremely*

per·cus'sion the act of firmly tapping the surface with a finger or small rubber hammer to elicit sounds for diagnostic purposes

per'i- a prefix meaning *about, beyond, around, near*

per"i·ne'o- a combining form meaning *relating to the perineum*

per"i·ne'um the region between the anus and the scrotum in the

male, the region between the anus and the lower cleft of the vulva in the female

pe riph'er y the external boundary or surface of any body, the region in which nerves terminate

per''i stal sis a progressive wave of contraction seen in tubes provided with longitudinal and transverse muscular fibers, as in the intestines whereby food contents are moved from the stomach to the anus

per''i to ne'um the serous membranous lining of the interior abdominal cavity and its contained viscera

per' i to ni'tis inflammation of the peritoneum

per'me a ble passable, penetrable, used especially of substances that allow the passage of fluids

pet''ro la'tum a purified semisolid oily substance obtained from petroleum (unrefined oil pumped from oil wells), light yellow or amber in color, insoluble in water, used as a bland, protective dressing and as a base for ointments Also called *petroleum jelly, yellow petrolatum*

pha lan'ges (plural of pha'lanx) the bones of the fingers or toes

phar'ma co- a combining form denoting *drug*

phar''ma col'o gy the science of the properties of drugs, particularly their actions

phe'nol also called *carbolic acid*, a caustic that causes severe burns of the skin and mucous membranes, a poison

phle bi'tis inflammation of a vein

phleb'o-, phleb- a combining form denoting *vein*

phlegm a sticky, stringy mucus, secreted by the mucosa of the upper air passages

pho'bi a (-pho'bi a, a combining form) any irrational fear characteristic of a mental disorder, dread of objects, events, etc

phys''i ol'o gy the science that deals with the functions of living organisms and their parts

pla cen'ta the organ on the wall of the uterus to which the embryo is attached by means of the umbilical cord and through which it receives its nourishment

plas'ma the fluid portion of the blood

pleu'ra the serous membrane enveloping the lung

pneu'ma-, pneum- a combining form meaning *wind* or *air*

pol i o-, pol i a combining form denoting *gray*, used to denote *relation to the gray matter of the brain*

pol 'i o my' e li tis inflammation of the gray matter of the spinal cord, also called *infantile paralysis*

pol·lu′tion the act of making impure; defiling

pol′y- a combining form meaning *much* or *many*; especially in medicine denoting *excessive, affecting many parts,* or *diverse origin*

post- a prefix signifying *after, behind,* or *subsequent*

pos·te′ri·or behind or at the back of a part

pre- a prefix signifying *before*

pre″ma·ture′ occurring before the proper time, as a premature labor or birth

pro- a prefix denoting *for, before, in front of*

probe a slender, flexible rod, for exploring or dilating a natural channel

prog·no′sis the prediction of the duration, course, and termination of a disease, based on all of the information available in the individual case and knowledge of how the disease behaves generally

prone lying with the face downward; the opposite of *supine*

pro″phy·lax′is prevention of a disease

pros′the·sis an artificial substitute for a missing part, as a leg, hand, eye, denture

pseu′do-, pseud- a combining form meaning *false* or a *deceptive resemblance to a disease* or *condition*

psy′cho, psych- a combining form denoting *mind, mental processes, psychologic methods*

psy′chol′o·gy the study of the mental processes, the mind, the soul, and the functions such as thought, sensation, perception, memory, etc.

psy·cho′sis a specialized mental disorder, particularly one without organic disease accompanying it

psy″cho·so·mat′ic of or pertaining to the mind and body, as in conditions with an emotional background having both mental and physical aspects

pu′bis (pu′bes, plural form) the hairy region covering the pubic bone; the region above the sexual organs; the pubic bone

pu′ru·lent containing, consisting of, or forming pus

pus′tule a small, defined elevation of the skin containing pus

py′o-, py- a combining form signifying *accumulation of pus*

quad′ri- a combining form meaning *four*

quar′an·tine isolation or restriction in movements, communication, or intercourse between a person (animal, or plant ) suspected of a contagious or infectious disease and one or more not affected, employed to prevent spread of the infection or the disease

quin′sy acute inflammation of the tonsil and surrounding tissue

ra″di a′tion the act of diverging from a common center, treatment with radioactive substances

re- a prefix meaning *back* or *again*

re ac′tion a response to the stimulus

re cu′per ate regain health or strength

re cur′rent returning

re gur″gi ta′tion the return of food from the stomach to the mouth soon after eating, without the usual efforts at vomiting, back flow of blood through a heart valve that is defective

re″ha bil″i ta′tion the act of restoring one's health and efficiency, by re educative exercises, occupational therapy, or other therapeutic measures or means

re lapse′ a recurrence of disease after convalescence has apparently begun

re mis′sion the subsiding of disease symptoms, the period during which such subsidence occurs

re′nal referring to the kidney

re sus″ci ta′tion the revival of one apparently dead, or one in the process of dying by asphyxiation, by artificial respiration

re ten′tion the act of holding back, as urine or feces in the bladder or colon, respectively

ret′i na the light receptive layer and terminal (end) expansion of the optic nerve in the eye

re trac′tor a surgical instrument for holding back the edges of a wound to provide access to deeper parts or regions

ret′ro-, re′tro- a combining form meaning *back, backward,* or *behind*

rhi′no-, rhin- a combining form signifying *the nose*

rig′id stiff, hard

rig′or mor′ tis stiffening and rigidity of muscle which occurs after death

sac a pouch, a cyst, a bag like tumor

sar co′ma a malignant tumor derived mainly from connective tissue (not of epithelial tissue as in the carcinomas), designated as bone, periosteum, nerve, lymph node, and tissue tumors

sat′u ra″ted the state of any substance when it is either charged with or is holding in solution the utmost amount of another substance that it is capable of absorbing

scal pel a surgical knife with a short blade with a convex or straight cutting edge, rounded or pointed at the end

scle′ro- a combining form meaning *hard*

scle ro′sis hardening of a part from inflammation, degeneration,

or fibrosis (excess growth of connective tissue in a part or organ), as in the arteries or the nervous system

-scope a combining form denoting an instrument for seeing

scur′vy a deficiency disease, due to lack of vitamin C

se·ba′ceous refers to the act of secreting, or the glands that secrete sebum (an oily secretion)

se·cre′tion the function of separating material from the blood, which is either eliminated from the system or used to perform special functions

sed′a·tive an agent that quiets activity

sed″i·men·ta′tion the act of producing a precipitate (substance that has separated from a solution by falling to the bottom of a container, or that floats at the top of the solution)

seg′ment a piece cut off or marked off

sem′i- a prefix meaning *half*

se′nile relating to or produced by old age

sep′tum a partition; a dividing wall between two spaces or cavities

se′rous relating to or characterized by serum

se′rum the clear liquid separating from the blood after the fibrin has coagulated

slough the necrosed (dead) matter separating in cases of ulceration and the like

smear preparation of secretions or blood for microscopical study, made by spreading them on a glass slide

sol′vent a liquid that is capable of dissolving another substance; dissolving

so·mat′ic relating to the body

som·nam′bu·lism sleepwalking

sor′des filth, dirt, especially the crusts that accumulate on the teeth and lips in continued fevers

spasm a sudden, involuntary muscular contraction

spas′tic relating to or characterized by spasm; produced by spasms

spe·cif′ic a medicine with a distinct influence on a particular disease

spec′u·lum an instrument for bringing into view parts otherwise hidden

spore the reproductive part of a microorganism, which does not represent a genuine cell, that is extremely resistant to heat or other adverse environmental factors

spu′tum the material ejected from the mouth in spitting, consisting of saliva and mucus, or in the case of tuberculosis, sputum stained with blood (rusty sputum)

stag na'tion not flowing, not running, motionless, not active
sta'sis in blood vessels, complete stoppage in the flow of blood, delay in passage of fecal matter along the intestines
ster'ile free from germs, not capable of reproducing
ster'to rous characterized by deep snoring, as in some disease, hoarse breathing, as the result of the air passages being obstructed with mucus
strain excessive stretching, overexert, overuse of a part
stupe a cloth or sponge soaked with hot water, wrung out practically dry and used to apply heat to a part a medicated stupe may be sprinkled with turpentine to act as a counterirritant
styp'tic astringent, stopping hemorrhage or bleeding by means of an astringent agent such as alum or tannic acid
sub- a prefix signifying *under, beneath, below*
sub"cu ta'ne ous beneath the skin, hypodermic
su'dor sweat
su"dor if'er ous producing sweat
sul fa drugs a family of drugs of the sulfonamide type that are extremely valuable for their bacteriostatic properties The most widely used sulfa drugs are sulfanilamide, sulfathiazole and sulfadiazine
su'per a prefix meaning *above*, *upon*, or *excessive*
su per fi'cial relating to, located on, or confined to a surface
su pine' lying on the back face upward, the opposite of *prone*
sup'ple men'ta ry added, additional
sup"pu ra'tion producing pus
su'pra a prefix denoting *upon* or *above*
sus cep'ti ble sensitive to, able to receive, likely to acquire a disease if exposed to the causative agent
su ture a stitch or a row of stitches closing the lip of a wound, in anatomy, a line of junction, as that between bones in the skull
sym- see syn
sym"pa thet'ic relating to or produced by sympathy, pertaining to the sympathetic nervous system
syn- a prefix signifying *with* or *together*
sys'to le the contraction phase of the cardiac cycle
tach'y- a combining form signifying *swift*
tach'y car'di a excessive rapidity of the heart beat
tar'sus the instep, consisting of the tarsal bones of the foot
ther'a py treatment
ther'mo- a combining form meaning *heat*
tho'rax the chest

throm′bo-, thromb- a combining form meaning *pertaining to a thrombus*

throm′bus a clot of blood formed within the heart or blood vessels, usually caused by slowing of the blood circulation or by changes in the blood or blood vessels

tox·e′mi·a a condition in which the blood contains poisonous substances generally due to the absorption of toxins from a local infection; blood poisoning

tox′in a poisonous product of vegetable or animal cells

trac′tion the act of drawing or stretching or pulling

trans- a combining form meaning *through* or *across*

trau′ma a wound or injury

tu′mor a swelling; a mass of cells resembling normal ones, not serving any purpose in the body and developing at the expense of the body, which may be benign or malignant

ul′tra- a prefix denoting *beyond, excess*

un·con′scious insensible; not aware of one's surroundings

u′ni- a combining form denoting *one*

u·re′thra the canal through which the urine passes from the neck of the bladder to the urethral meatus (terminal or outside opening)

u″ri·nal′y·sis analysis of the urine

ur″ti·ca′ri·a an allergic reaction of the skin marked by the development of wheals which cause intense burning and itching; hives or nettle rash

u′ter·us the womb; the organ which receives the fertilized ovum, during the development of the fetus, and which expels the fetus during labor

var′i·cose a swollen and knotted condition of the veins

ven′tral referring to the belly; the anterior aspect of the human body

ves′i·cle a small bladder; a sac

vi′rus pathogenic microorganisms smaller than most kinds of bacteria, many of them being much too small to be seen by ordinary microscopes

vis′cid sticky; adhesive; glutinous

vis′ce·ra (plural of vis′cus) the organs enclosed within four great cavities, the cranium (within the skull), thorax, abdomen, and pelvis; especially organs within the abdominal cavity

vi′ta·mins a group of organic compounds necessary to the normal growth and maintenance of the body, that are found in certain foods, such as vitamins A, B, C, D, etc.

void empty the bowels or the bladder; evacuate

vul'va the external organs of generation in the woman

wheal a circumscribed (delimited) area of skin, edematous (swollen), which itches intensely, caused by insect bites, nettle stings, proteins, or serums to which the person is allergic, or other physical causes such as heat, cold, or sunshine

wound an injury to the body in which the skin, mucous membrane, or conjunctiva is broken, a surgical incision

zy go'ma the cheekbone, malar bone

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